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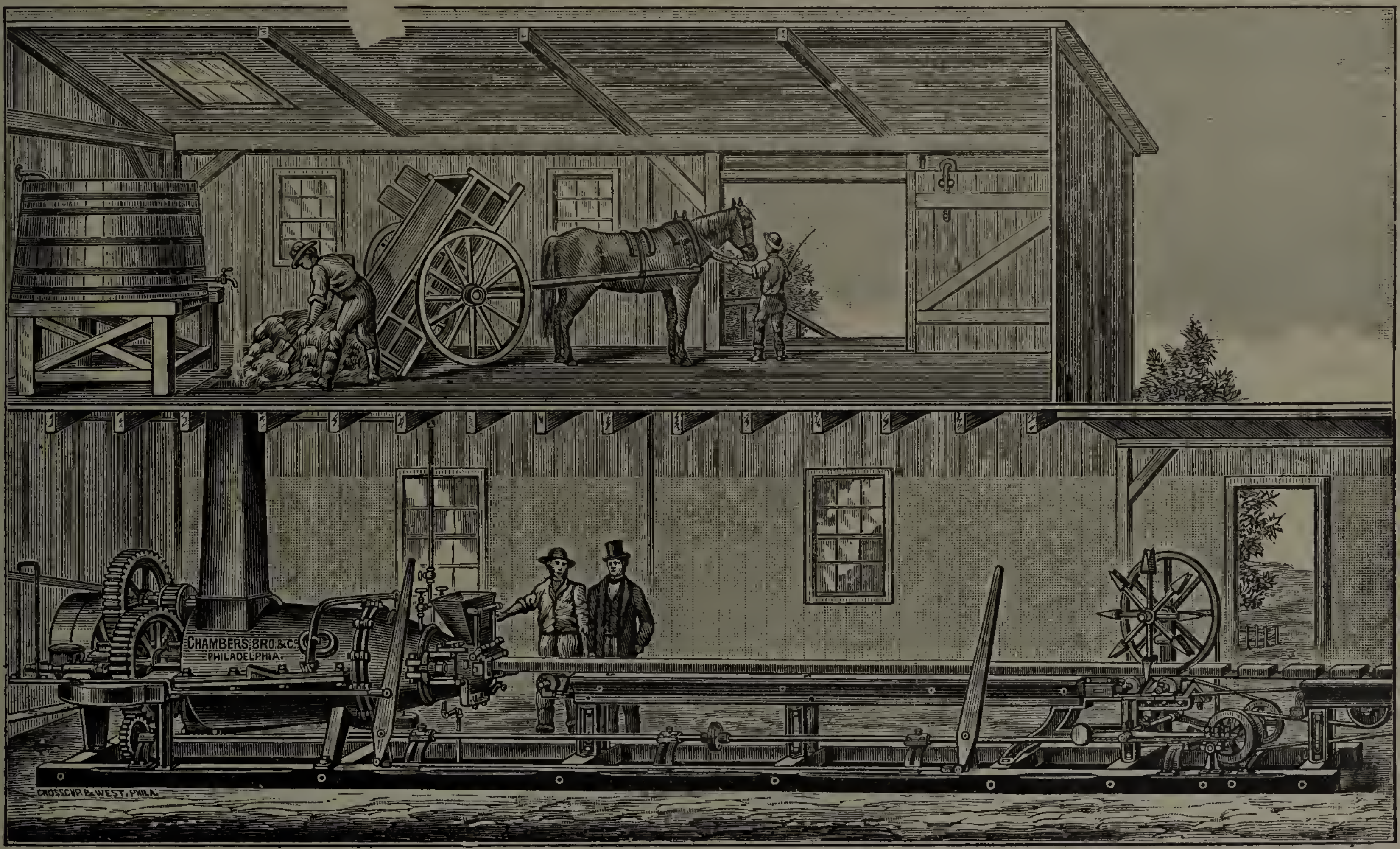
THE CLAY WORKER

A JOURNAL DEVOTED TO ALL CLAY WORKING INTERESTS.
INCLUDING BRICK TILE TERRA COTTA SEWER PIPE POTTERY ETC.
T. A. RANDALL & CO. PUBLISHERS.

Vol. XI, No. 1. INDIANAPOLIS, IND., JANUARY, 1889. Subscription: {$1.00 a year in advance.

IMPROVED BRICK MAKING MACHINERY.

25,000 and 50,000 BRICKS PER DAY CAPACITY.


CHAMBERS, BRO & CO. PHILADELPHIA.
CROSSCUP & WEST. PHILA.

TEMPERED CLAY, SANDED SURFACES, MOULDED STIFF ENOUGH TO IMMEDIATELY HACK.

Guaranteed to give satisfaction and furnished to responsible Brick Makers on thirty days trial.

Stone Extracting Clay Crushers, Clay Elevators,

ARTIFICIAL BRICK DRYERS.

Chambers Brothers' Company, - Fifty-Second Street below Lancaster Ave.,

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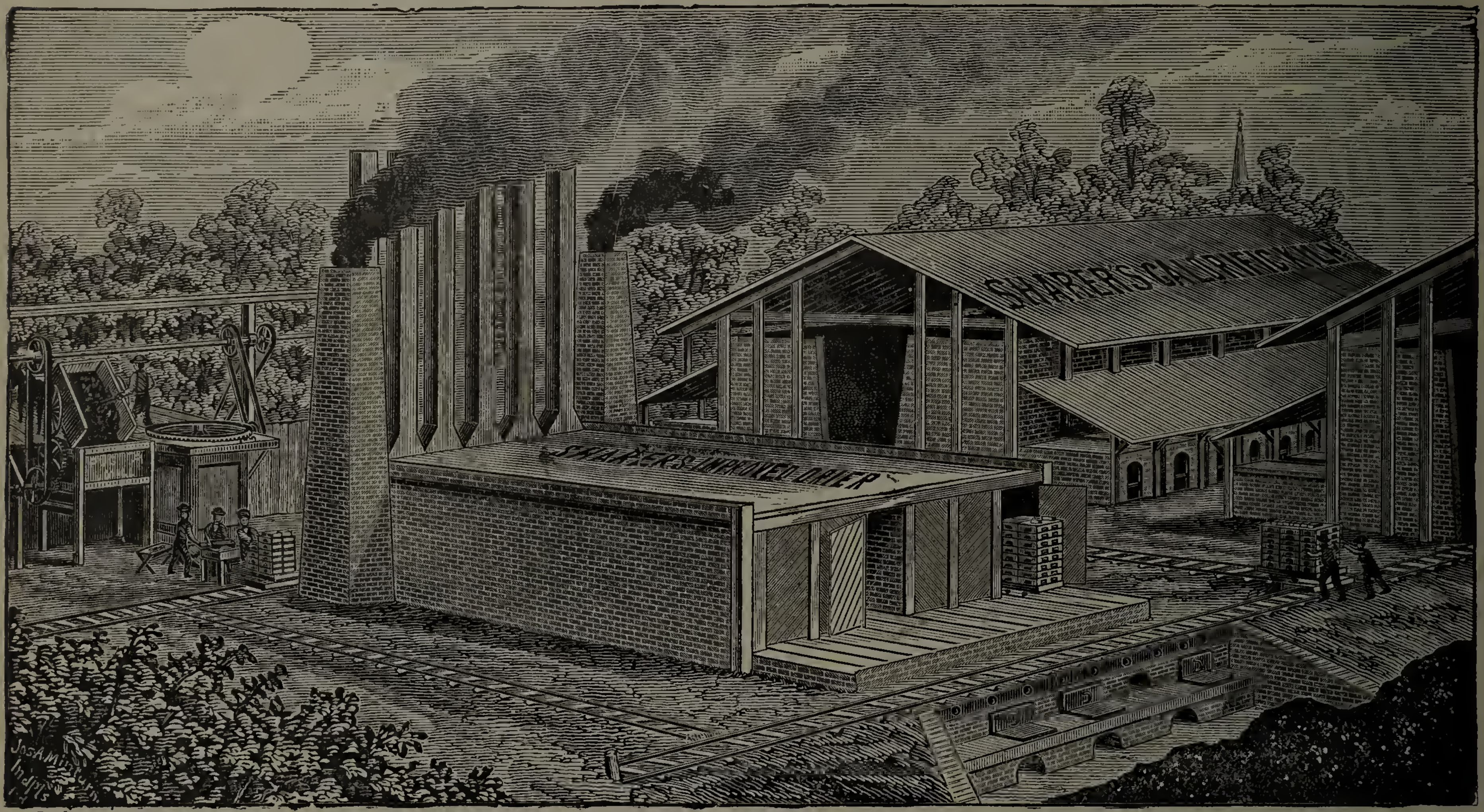

SHARER'S PATENT

CALORIFIC KILN.

For Burning Brick, Tile, Etc.

I respectfully invite attention to, and solicit careful examination of the many points of excellence combined in our IMPROVED KILN, for burning Brick, Drain Tile, Etc. They are now the STANDARD KILNS OF AMERICA, known as the CALORIFIC KILN. These Kilns are now in use in nearly every State and Territor in the United States and in Canada. They are SUPERIOR TO AND LESS EXPENSIVE than any other kiln now in use. Are Reliable and Durable, and any man of ordinary intelligence can operate them. Their construction and process of burning is such as to preserve SOUND AND SOLID ARCH BRICK; scarcely discernible as arch brick by those most familiar with brick, and suitable for any work where the best of brick are required and enables the operator to utilize any refuse fuel with the best of results.

No better fuel than coal slack being required—one ton of which is equivalent to two cords of wood burned by the old process. The cost of LABOR AND FUEL is one-half less than by the old process. Obtaining an increased average value of the products. Producing a MERCHANTABLE BRICK OR TILE OF EVERY ONE SET IN KILN. Effecting a saving of all the usual waste, unavoidable by the old and VERY CRUDE METHODS used for burning brick or tile. There being no bats, wedge-shaped blackended brick or tile in arches; and but few Salmon brick or tile—95 to 98 per cent. being Hard or Lined Brick, of UNIFORM COLOR AND SIZE, and of better metallic ring and much stronger than those burned by the old laborious and uncertain manner.

ONE MAN, on a turn, will burn a kiln of 300,000 Brick with greater ease than FOUR MEN will by the old process. Contractors and builders will pay more for brick burned in our Kiln, as they can well afford to do, because there is no waste and their men will lay up several hundred more per day, there being no time lost in sorting or slushing up around bats or ill shaped arch brick, and no loss of time by shattered bricks breaking to pieces in attempting to cut them. This is apparent to any one, and will appeal to the good judgement of all.

Parties having any apprehensions or fears of the merits of these Kilns can arrange to have a man to superintend the construction and burning of one or more kilns by stipulating to pay his expenses and entering into conditional contract about the Right to use them.

☞ References and all information given on application by letter.

SHARER'S IMPROVED

Drying Kiln.

I desire to call attention to my improved method of drying Brick, Tile, etc. Clay Workers, and especially Brick Makers have long felt the want of some means of Drying whereby they could avoid loss by storms, and loss of time by working in wet or dry weather, and prolong the season by working later in the fall and earlier in the spring, or all the year if necessary. This want is fully overcome by the use of my IMPROVED DRYING KILN. It has been thoroughly tested and has proven a complete success.

This Dryer requires but little room and is comparatively inexpensive; will last a life-time, and reduces the business to a system and gives the manufacturer control of his business. It is adapted to the largest as well as the smallest works—to hand or machine made brick.

Some of the Advantages Arising from the Use of the Dryer.

1. It enables the manufacturer to dry brick EVERY DAY, as fast as made without regard to the weather, and enables him to sell for future delivery, and KNOW ASSUREDLY that he will have them ready for delivery when called for, and also enables him to run his work TEN OR TWELVE MONTHS of the year; instead of five or six months, as is usually the case.

2. It saves a large amount of labor required by the old method of wheeling to sheds or yards; edging, hakeing, and afterward wheeling from hake to kiln to be set. NOT A TRUCK OR WHEELBARROW NEEDED.

3. No loss, or damaged brick by storms or frost, and gives the manufacturer control of his business.

4. It saves the labor and expense of making extensive yards or sheds, and keeping them in repair. The room required for a Dryer is only a small fraction of what is required by the old methods. A space 100x75 feet is sufficient for a Dryer with a daily capacity of 60,000 brick.

5. As no bricks are lost by storms or frosts, or pitted or washed by sudden showers, no time lost by wet days, or soft yards after the rain is over, its advantages will be readily appreciated.

One other advantage, wich, although the last I mention; IS BY NO MEANS THE LEAST—that is PEACE OF MIND AND REST to the manufacturer.

All unset brick being under a tight roof, secure from rain or storms, the mind is freed from annoying apprehensions of damage or destruction of his property.

GEORGE W. SHARER, Proprietor, Terre Haute, Ind.

E. A. KING, 48 Congress St., Boston, Mass., Special Agent New England States.] [HUGH CAMERON, Toronto, Ont., Special Agent Dominion of Canada.

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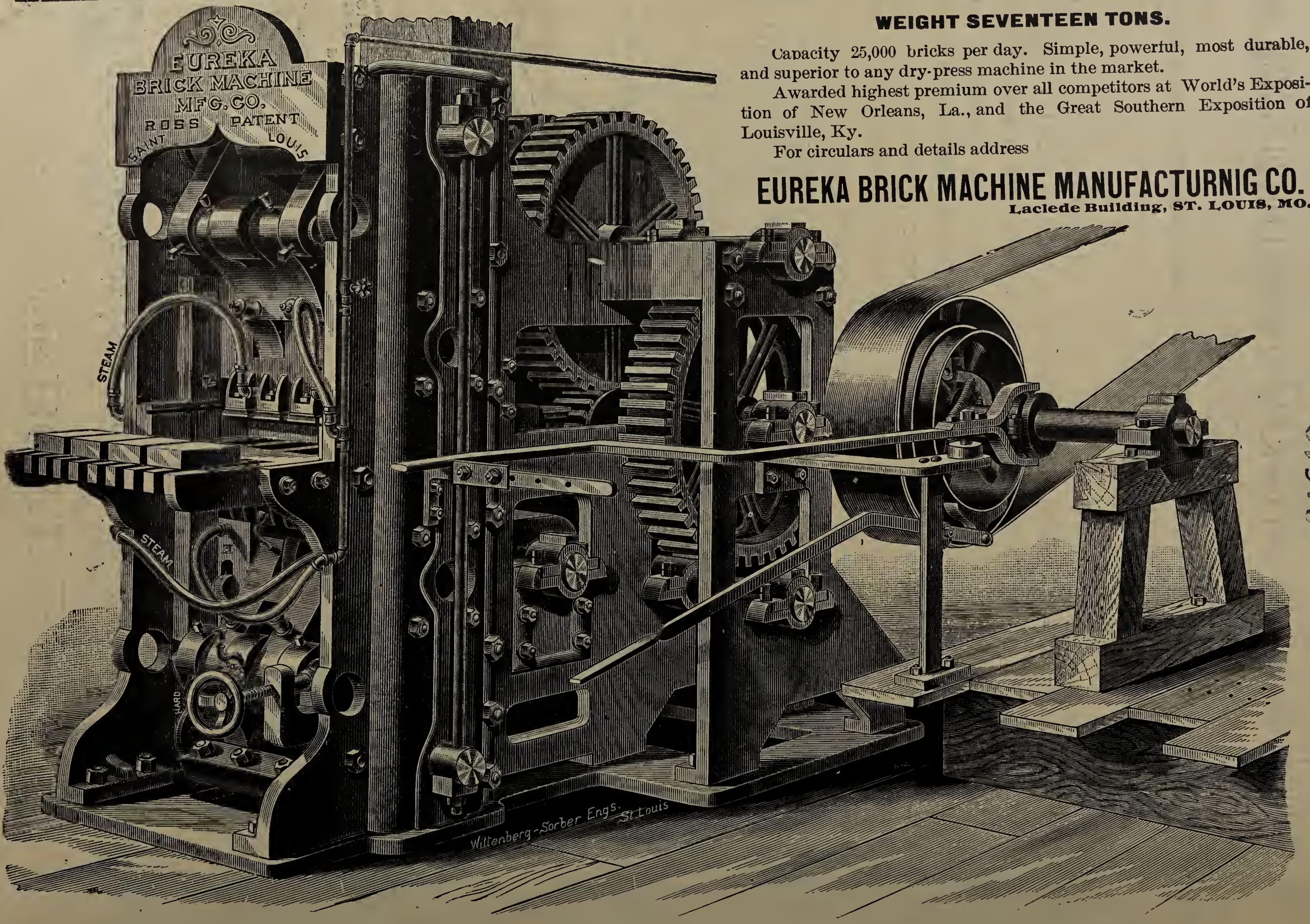

WEIGHT SEVENTEEN TONS.

Capacity 25,000 bricks per day. Simple, powerful, most durable, and superior to any dry-press machine in the market.

Awarded highest premium over all competitors at World's Exposition of New Orleans, La., and the Great Southern Exposition of Louisville, Ky.

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EASTERN AGENCY, 1321 F STREET, N. W., WASHINGTON, D. C., FRANK P. STONE, AGENT.

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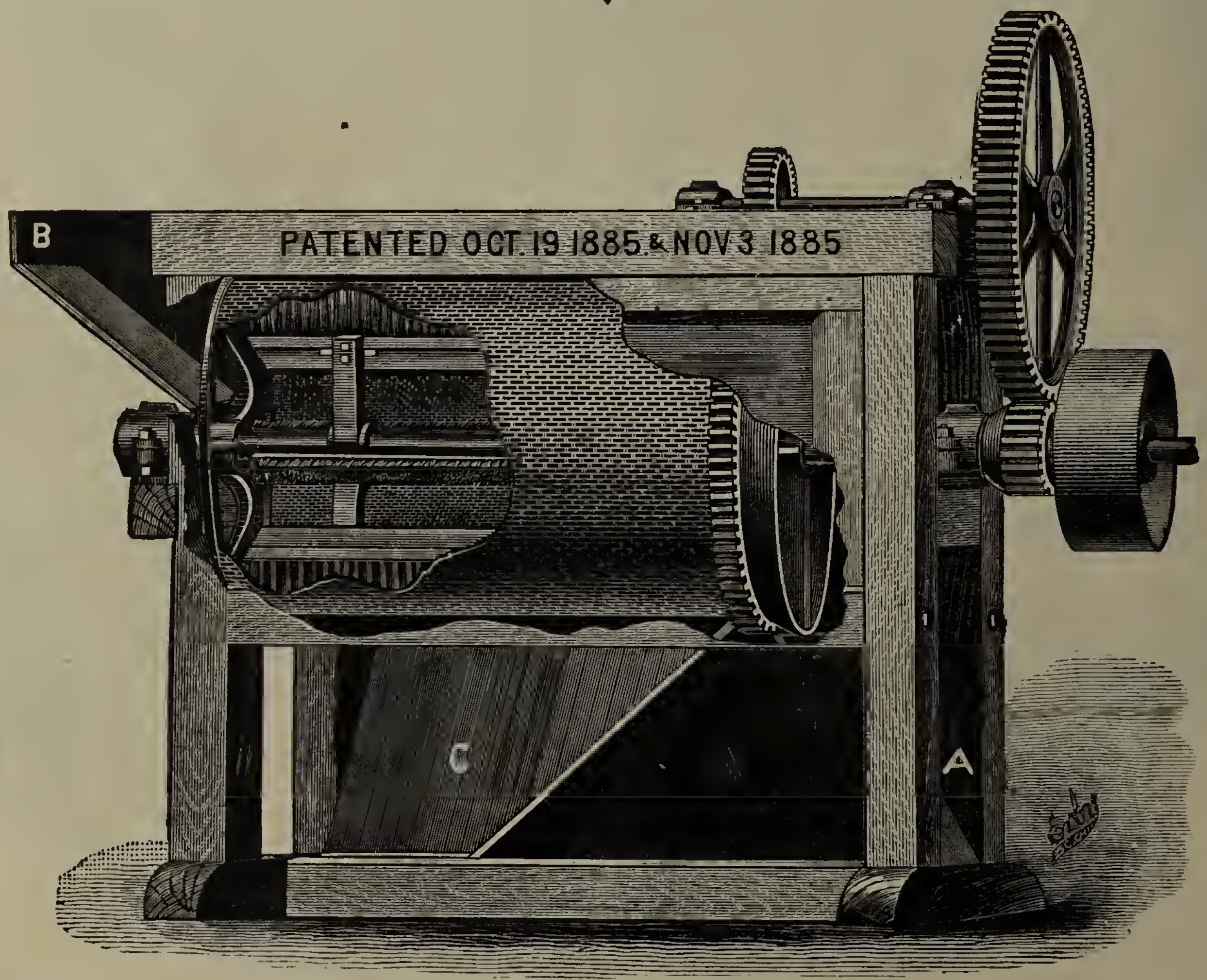
THE BOYD

Clay Pulverizer and Stone Separator.

ACKNOWLEDGED THE BEST.



B.
Dry or Semi-Dry Clay goes in here.

C.
Pure Clay comes out here.

A.
All Stones, Pebbles & foreign substances come out here.

I OFFER to those engaged in Clay-working, a machine that has no equal for removing Stones, Roots, Pebbles, or other foreign substances, and reducing Clay to Granules, for Dry or Semi-Dry Press Brick making, Terra Cotta, Tile, or other articles manufactured from Clay, which require a *Strictly Pure Quality.*

It is especially valuable to makers of Fine Press Brick, Tile, or Terra Cotta, as the lime-stones and pebbles are removed entire—not crushed and left in the clay. This machine is not a crusher, and will not pulverize wet clay or mud. The clay to be pulverized in this machine must be in a dry or semi-dry state.

Its capacity is from 40 to 60 tons per day of ten hours, and requires only from 4 to 6 horse-power to drive.

ROBERT B. SMITH,

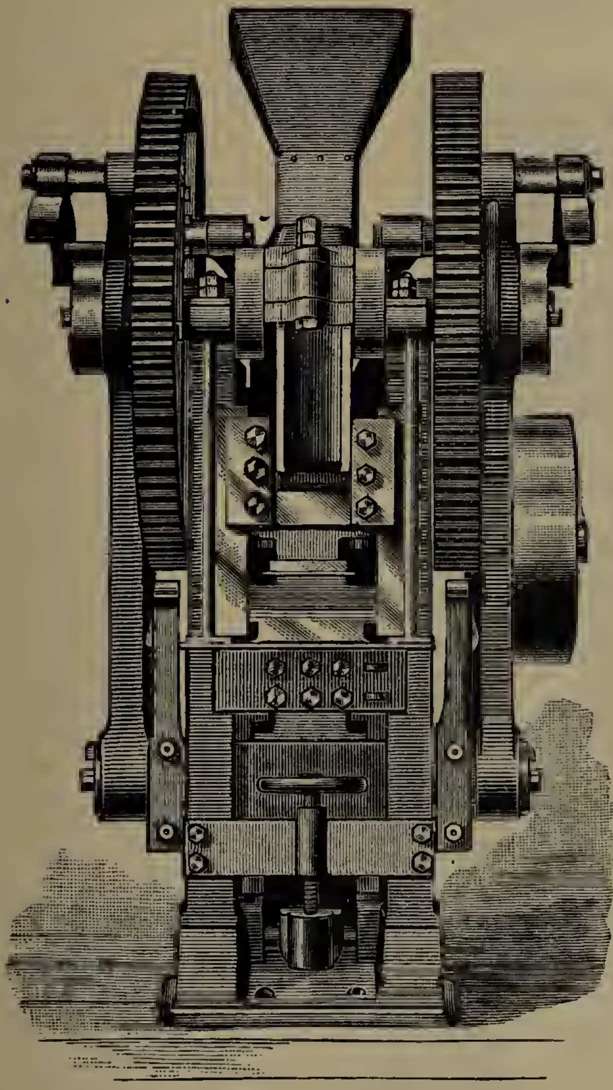
OFFICE, NOS. 116 and 118 DEARBORN STREET, ROOM 55. *Licensed Manufacturer.*

CHICAGO, ILL.

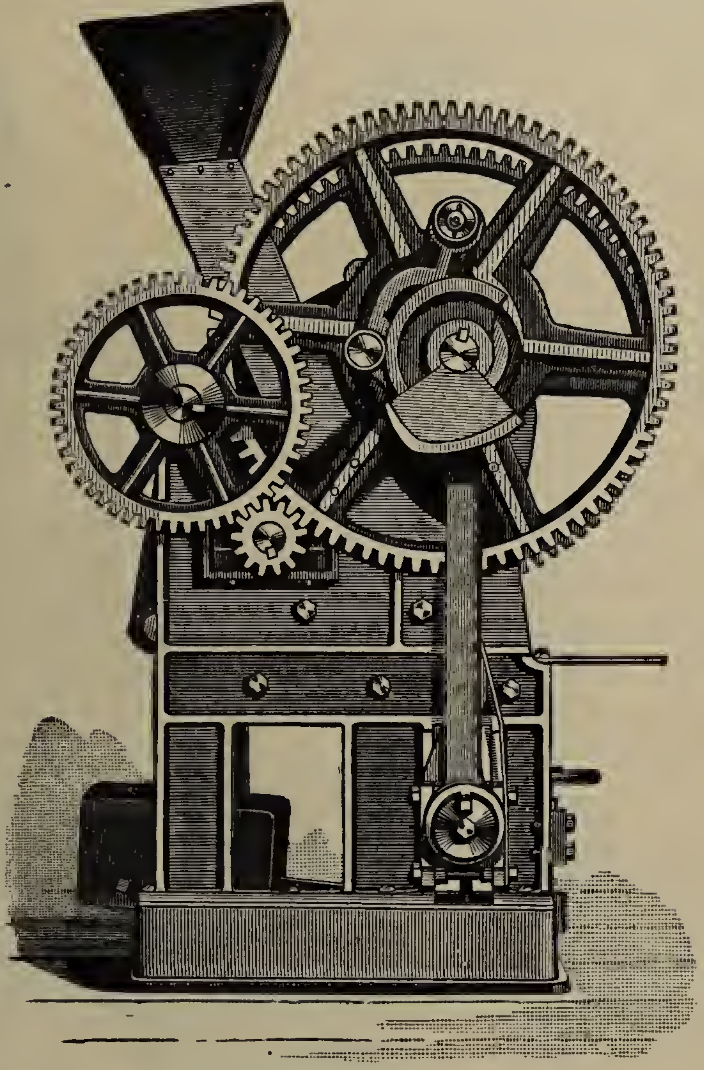
Agency of the Carman Dry or Semi-Dry Press Brick Machine.

CARMAN

DRY OR SEMI-DRY PRESS BRICK MACHINE.



FRONT VIEW.



SIDE VIEW.

The above cuts represent the Carman One-Mould Press Brick Machine for Manufacturing Brick by the Semi-Dry Process.

This machine is pronounced by experts in the brick business, to be the best One-Mould machine in the market. It is certainly the most durable and simple in its construction.

Its capacity is from 5,000 to 7,000 bricks per day of ten hours. We manufacture a Two-Mould machine of double the above capacity.

We will be pleased to test any clay shipped us ("freight prepaid") and return you bricks properly burned, showing the exact color your clay will assume in bricks made by this machine.

For terms and further particulars, address or apply to the undersigned.

ROBERT B. SMITH, Agent, Chicago, Ills.

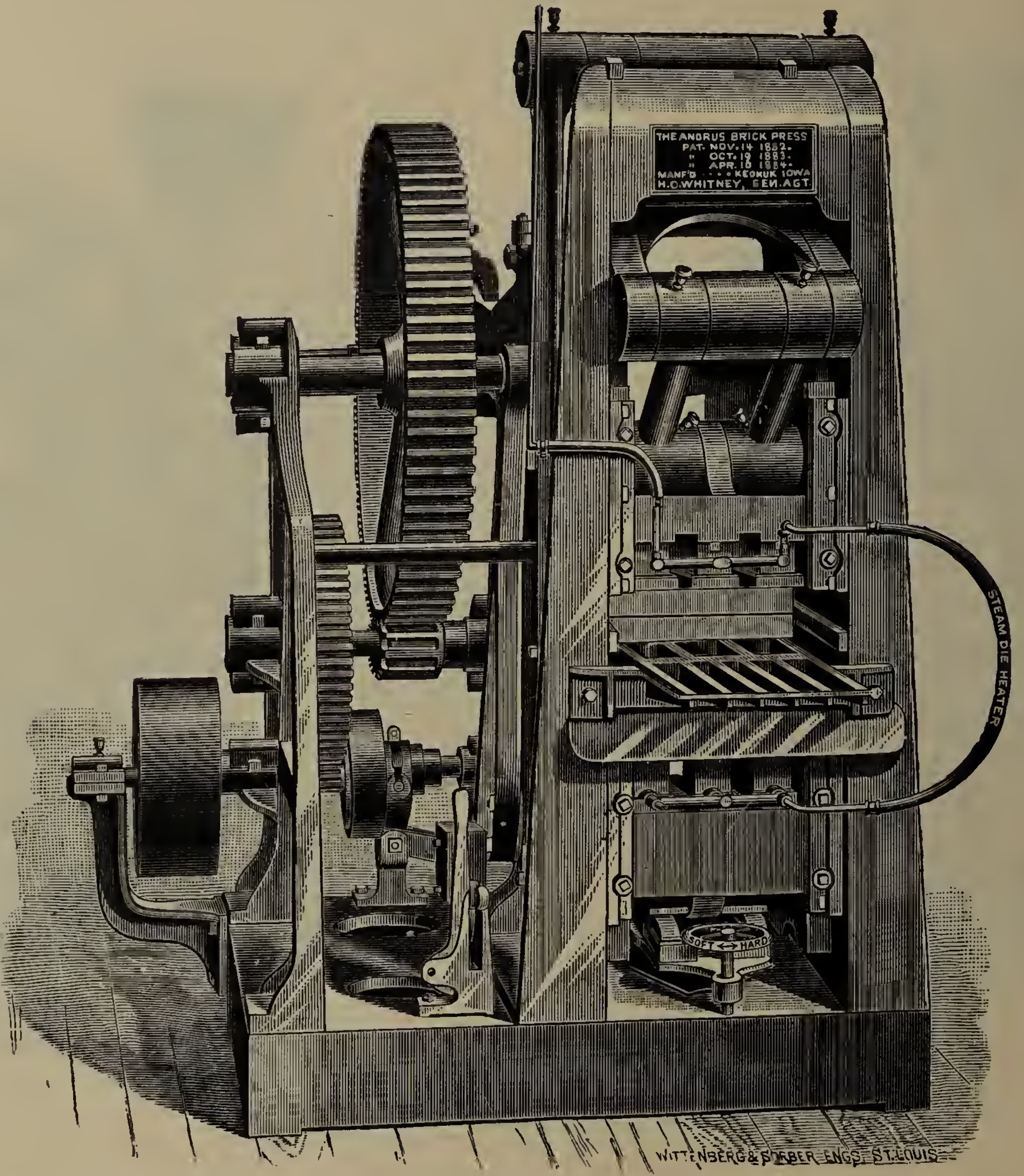
116 AND 118 DEARBORN STREET, ROOM 55

Licensed Manufacturer of the Celebrated Boyd Clay Pulverizer and Stone Separator.

THE

Improved Andrus Double Pressure Brick Press.

UNRIVALLED FOR SIMPLICITY, POWER AND DURABILITY.



The Pressed Brick made on the Andrus Machine have been tested by the U. S. Government and adopted for fronts in Government Buildings.

Built at our OWN FACTORY with heavy forged STEEL pressure arms and fully guaranteed against breakage. Not an experiment but a TRIED and PROVEN success.

60 machines in successful operation the past season. Examine it before purchasing.

Ittner Bros., St Louis, Mo., using the Andrus Presses produced 36 large kilns of brick of unsurpassed quality the past summer.

Samuel J. Rose & Son, Chester, Pa., and many others have made a splendid success.

The Andrus Press, Clay Crushers and Pulverizers can be seen in operation at all times at Our Factory.

Send for descriptive circular and reference, address

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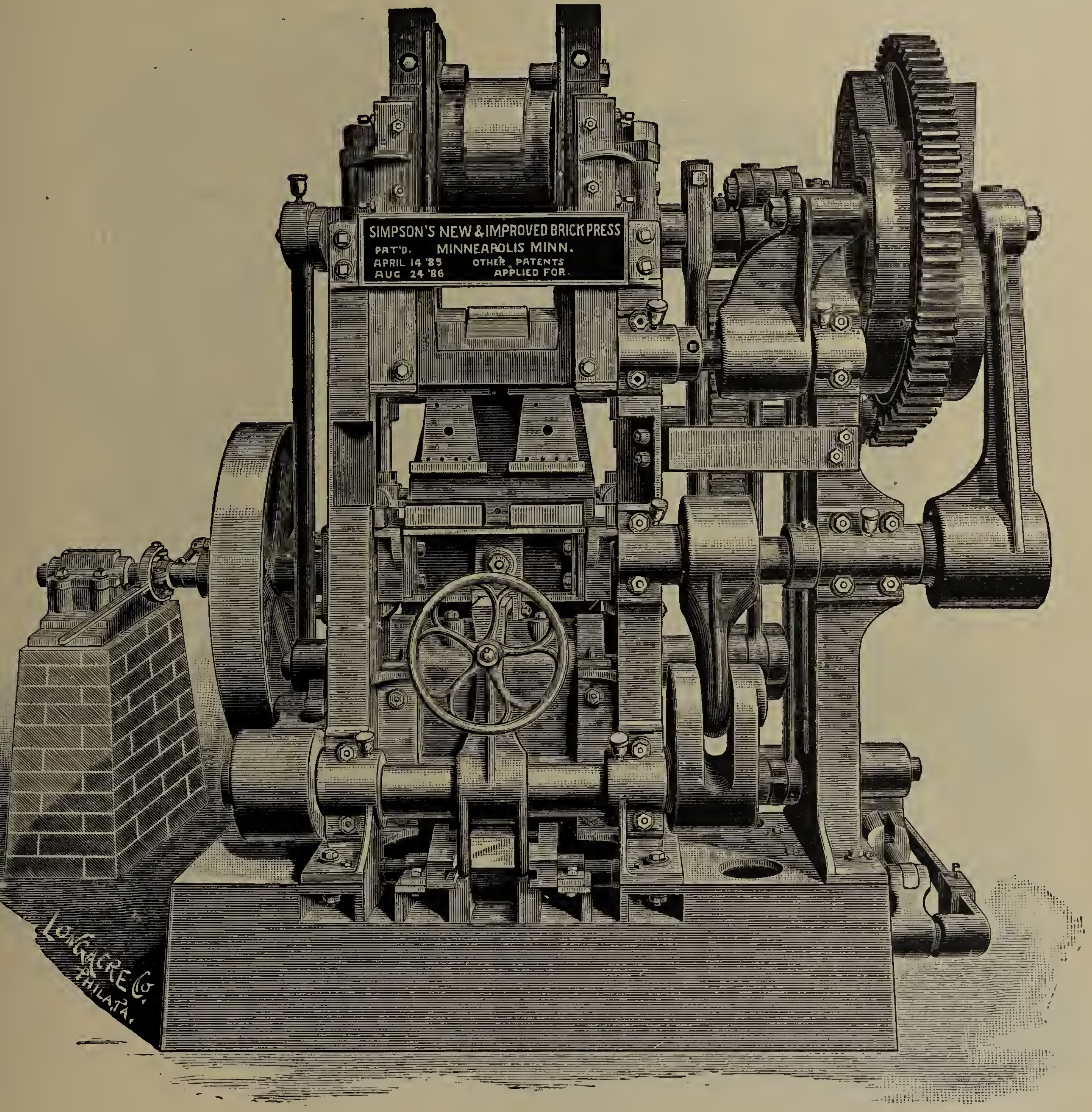
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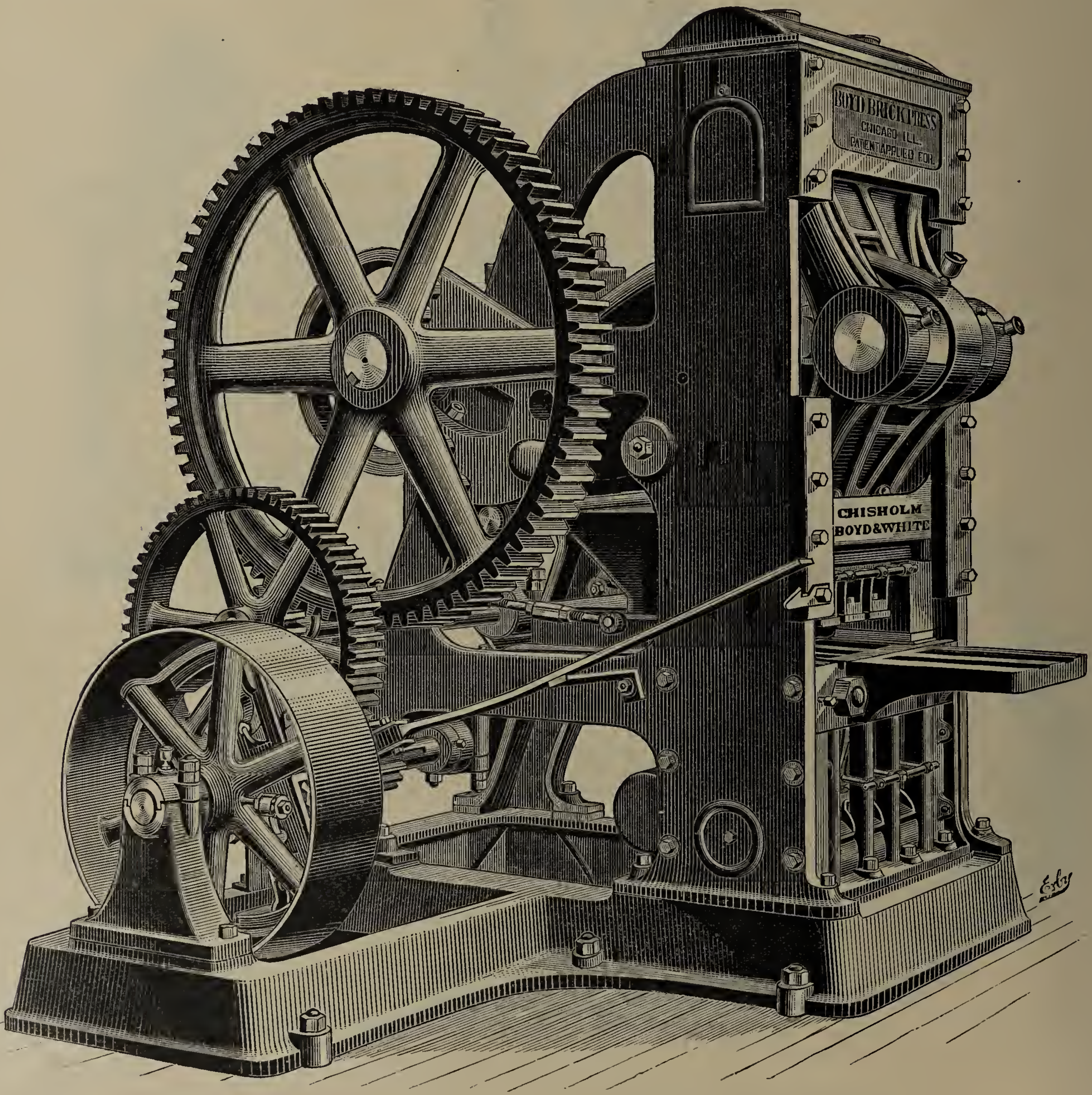
Will make a greater quantity of Perfect Brick (of maximum weight) per mould for a consecutive number of days than any other Semi-Dry Brick Press in the world and Superior in Quality to Hydraulic Pressed Brick.



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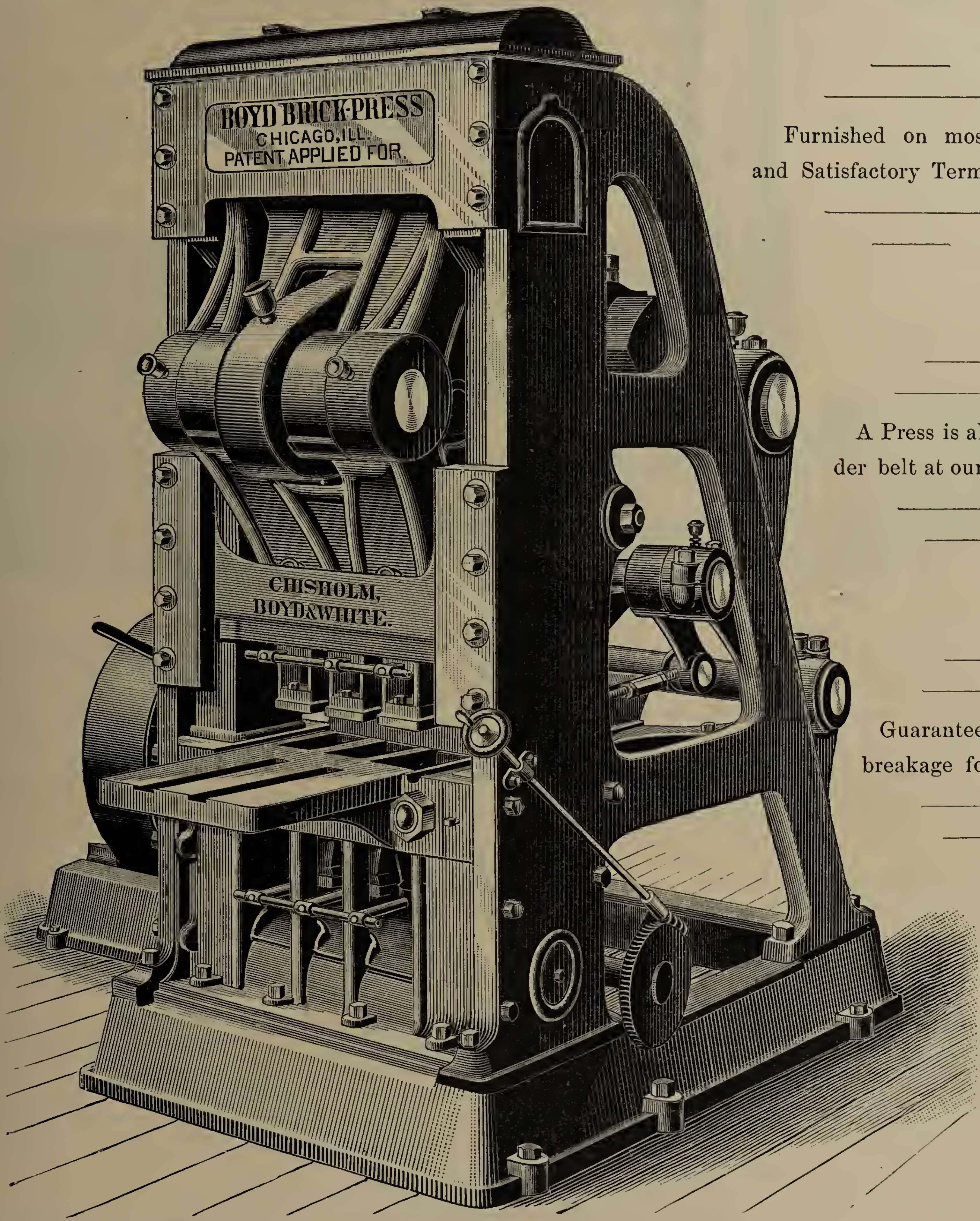
A PERFECT MACHINE

WITH

ANY NUMBER OF MOULDS DESIRED.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PATENT APPLIED FOR.
CHISHOLM,
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Furnished on most Liberal and Satisfactory Terms.

A Press is always under belt at our Factory.

Guaranteed against breakage for 2 years

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I. & M. WOLFF & COLEMAN

THE "IRON CLAD"

- Dries Brick and Tile with Exhaust Steam from Engine in day-time and Live Steam at night.
- Pipes Thoroughly Isolated in Iron Clad Box.
- Easily Accessible to Examine and Repair.
- Not Dependent upon Direction of Wind or the Condition of the Atmosphere.
- Features Radically Different from any other Drier.
- Is Broadly Secured by Bona Fide Patents.
- Buildings Not Expensive to Construct.

Patentees and Sole Builders

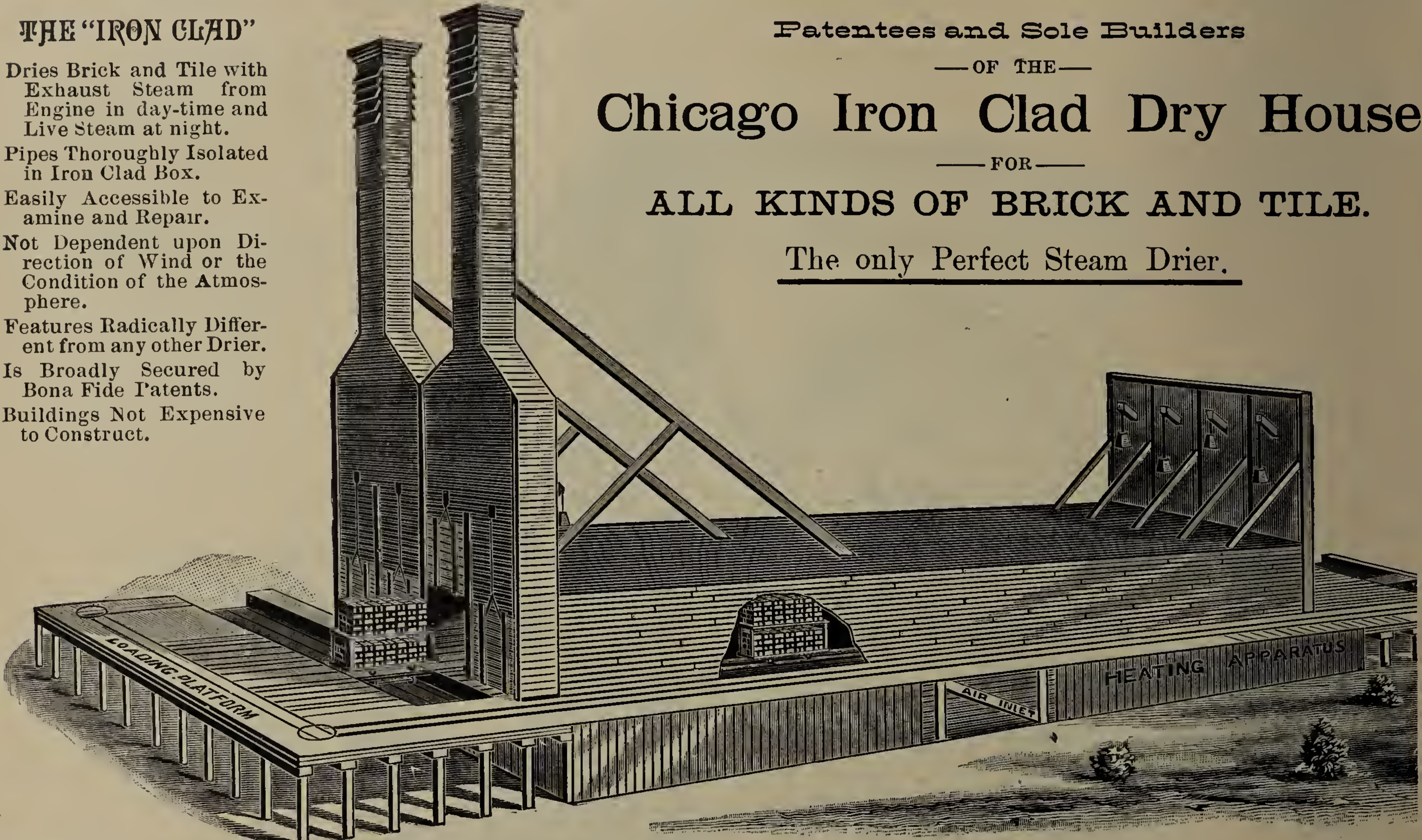
—OF THE—

Chicago Iron Clad Dry House

—FOR—

ALL KINDS OF BRICK AND TILE.

The only Perfect Steam Drier.



This Dry House is a combination of the Drying Floor and Tunnel System. The radiation from the Iron Floor extending over the heating coils dries the lower tiers of bricks. The perforation of the Iron Floor gives an even distribution of the heat and prevents cracking. The steam heat is not so intense as to melt down the bricks or bake them. The bricks are dried uniformly; they come out smoothly and burn evenly, with a good ring. The water-smoke is drawn off rapidly as made and the drying is even and gradual. Stiff mud bricks are hacked on double deck cars and thoroughly dried in 24 hours. Soft mud bricks are dumped, on pallets and cars carry the same through Dryer in 24 hours. Semi-dry and dry pressed bricks are specially provided for and can be dried without injury. We can convert other Dryers into our system, thereby improving product and capacity. Our buildings are constructed enentirely of wood; are simple, cheap and easily erected. We furnish complete steam heating apparatus with pipes and connections, Iron Cars, Turn-tables, Transfer Cars, Rail and superintendence. Confer with us before contracting elsewhere. We will save you money time and trouble. State character of bricks made, name of machine used and capacity required.

W. C. McMillan, Pres.
Geo. H. Paine, Vice-Pres.
Richard H. Hall, Sec'y and Treas.
F H. Wolf, Gen'l Manager.

—OFFICE OF—
ANNA RIVER BRICK CO.,
120 Griswold Street.

Detroit, Mich., October 8, 8188.

Messrs. I. & M. Wolff and Coleman,
Chicago, Ills.:

Gentlemen—Yours received. We will cheerfully give you the following facts about the Iron Clad Brick Dryer you put up at our yard at Hallston, Mich. We have had some experience in Dryers and have looked into them very thoroughly; and can confidently say that the Iron Clad is the best we have seen. In the construction of the Heating Apparatus and in every detail, you have given us the best. The Iron Cars, Transfer Cars and Turn Tables are superior to any we have seen, being strong, well made and convenient to handle. Our Dryer with the loading and unloading platforms occupies a yard space of 101 feet long by 68 feet wide. The buildings are constructed entirely of wood, divided into 5 rooms and all under one roof. Our storage capacity is 140 cars. We have not yet been able to ascertain fully the amount of brick the Dryer will dry per day but from results obtained, are fully satisfied it will dry 50,000 brick per 24 hours. With stiff mud bricks, made unusually soft, we can put as many as 625 to the car and they will come out bone dry without cracking or marking in the slightest degree. Their surfaces are smooth, with well defined corners and all equally dried. They come out in splendid condition to set in kiln, and burn with a good ring.

We consider this qite a triumph in the drying of brick and attribute it to the arrangement of the Heating Apparatus, with the specially constructed perforated Iron Floor covering the same, allowing the heat to rise up gradually and lazily throughout the bricks.

The stacks pull out the water-smoke rapidly and the bricks begin to warm up as soon as they enter the Dryer and the drying is, therefore, gradual and the heat well distributed. We will take pleasure in showing the Dryer to Brickmakers and wish you success in your business.

Yours Etc., R. H. Hall, Secretary.

I. & M. WOLFF & COLEMAN,

PATENTEES AND SOLE BUILDERS,

Write for catalogue.

No. 102 West Washington St., Chicago, Ills.

The Best Is The Cheapest.

The following parties, fully appreciating the merits of a *first-class brick dryer*, have contracted with us and we are now building for them our

IRON CLAD BRICK DRY HOUSES

AS FOLLOWS

Corning Brick Works, Corning, N. Y.,
Daily Drying Capacity, 25,000 Stiff Mud Brick.

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Daily Drying Capacity, 20,000 Soft Mud Brick.

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Daily Drying Capacity, 30,000 Stiff Mud Brick.

W. D. Isaac, Charleston, W. Va.,
Daily Drying Capacity. 25,000 Stiff Mud Brick.

T. W. Stanland, Summerville, S. C.,
Daily Drying Capacity, 25,000 Stiff Mud Brick.

Carteret Brick Works, Carteret, N. J.,
Daily Drying Capacity, 30,000 Semi-dry Pressed Brick.

Anna River Brick Co., Detroit, Mich.,
Daily Drying Capacity, 50,000 Soft and Stiff Mud Brick.

ADDRESS

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CHICAGO, ILL.

DRYERS! DRYERS! DRYERS!

FOR TILE, FOR DRY PRESSED BRICK,
FOR SEMI-DRY PRESSED BRICK,
FOR STIFF MUD BRICK,
FOR SOFT MUD BRICK.

It will pay you to have your bricks thoroughly and equally dried before setting in kiln. You can dry them more economically in

THE IRON CLAD DRYER

Than in the kiln, besides getting a more uniform burn and better bricks. Handling and wheeling bricks costs money, and the bricks are often marred and in bad shape when they go to the kiln.

ADDRESS

I. & M. WOLFF & COLEMAN,
102 West Washington St.,
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THE CLAY-WORKER

VOL. XI. INDIANAPOLIS, IND., JANUARY, 1889. No. 1.

Written for the Clay-Worker.

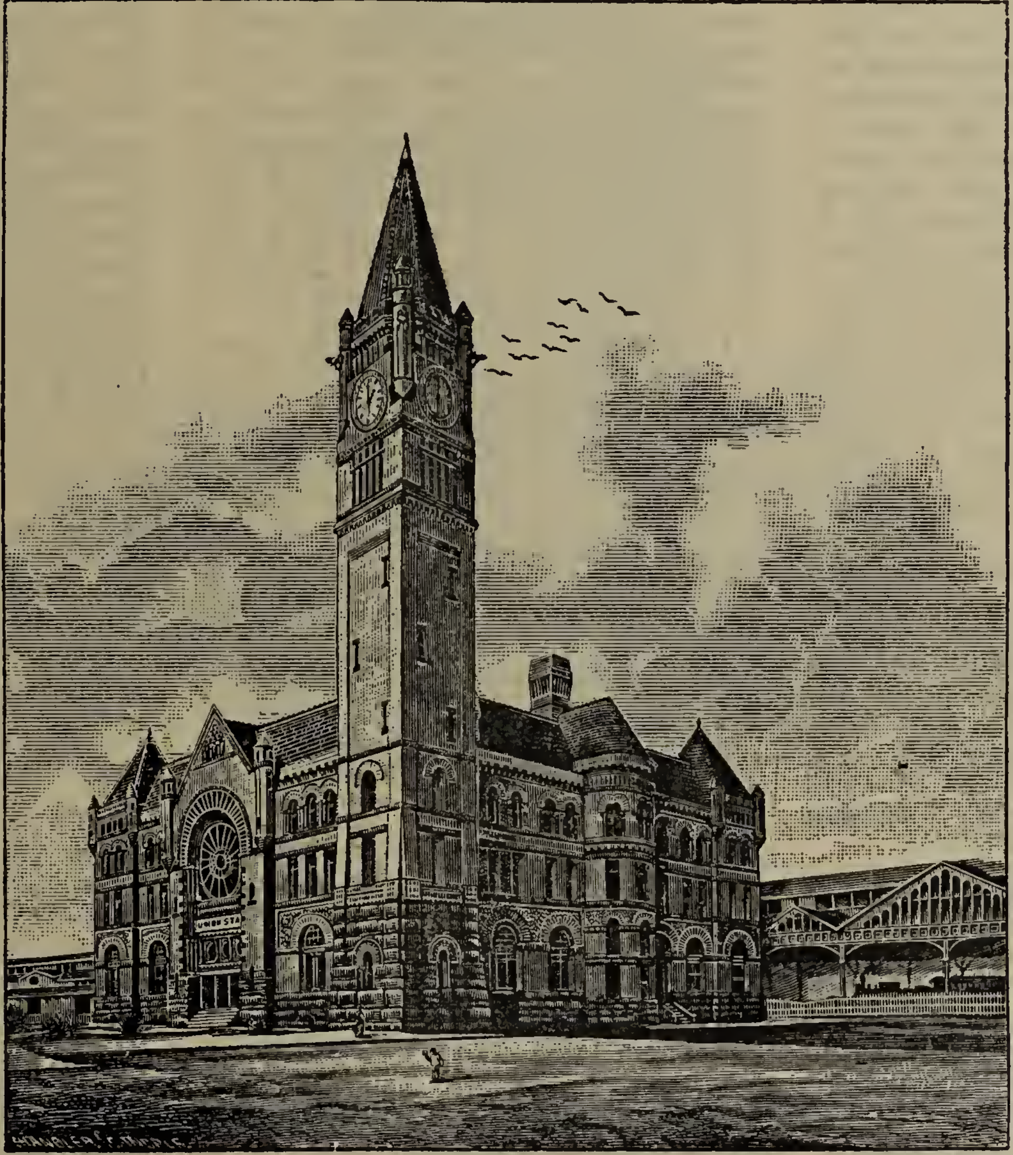
EXAMPLES OF AMERICAN BRICK AND TERRA COTTA WORK.

No. 12.

THE UNION STATION, INDIANAPOLIS.

Few, if any of the great cities of our country have made more marked advance in the past year than has our own Hoosier capitol. Among the most important improvements is our new Union Station, which is one of the finest structures of the kind in the world. Those who have seen the most noted railway stations, both in America and abroad, assert that while there are some larger stations, there are none that in all respects are equal to this. Its massiveness, finish and equipments are all that wealth and ingenuity can provide. Indeed the people of Indianapolis can now congratulate themselves upon the possession of a station which has no superior.

The main building is almost square and of the style of architecture known as Romanesque, which is marked by solidity and round arches. The tower, with its battlements and pinnacle, however, is a departure from the prevailing style, approaching that used by the English of several centuries ago in the construction of their castles. The exterior appearance of the station is striking. Its three lofty stories and mansard roof raise it high above surrounding structures; while severe and simple in outline and noble in proportions, the square tower rises from the northwest corner to a height of 185 feet. The materials used in the walls are the best. From the level of the street to a height of eight feet or more all is of great blocks of Missouri granite. On this rests the superstructure of pressed brick from famous kilns at Zanesville, O., lavishly trimmed with brown stone from Pennsylvania. There is also some excellent Terra Cotta trimmings in the tower. The walls range from two to five and one-half feet in thickness in different parts. The north front of the building is the most imposing, and faces on Jackson Place, an open court, which will be a perpetual "beauty spot" with its walks and flower beds and fountains. All about the station are laid substantial pavements of Brunswick asphalt on a heavy substratum of Portland cement and broken stone.



THE UNION STATION, INDIANAPOLIS, INDIANA.

The exterior of this great structure though fine and imposing is outdone by the rich and elegant fitting of the interior which challenges the admiration of the most exacting critic. Entering the main room which is 140 feet long and fifty feet wide with a beautiful arched ceiling of decorated glass 65 feet in height one is almost dazzled by the glitter of gold and the shimmer of marble. In each end of the room, high up, is a circular window twenty feet in diameter filled with the finest of cathedral stained glass pouring down beautiful rainbow hues upon the tiled floors and richly decorated walls. At a height of twenty-two feet a narrow balcony extends entirely around the room. The heavy brackets on which it rests are moulded and gilded in such a manner as to add much to the general effect. All about the entire room to a height of five feet is a wainscoting of red Tennessee marble.

In the adjoining waiting rooms, ticket offices, dining room, smoking room, barber shop, toilet room, news stand, etc., the same costly decorations and finish is carried out. All the first floor rooms except the main waiting room are wainscoted in heavily paneled native oak and the furniture and seating throughout are of oak also. The building contains four large and absolutely fire proof vaults, built into walls of the most substantial masonry. Two handsome marble drinking fountains ornament the main waiting room and furnish the thirsty travelers with pure, cool water. Every modern convenience is provided and the most exacting tourist must admit that but few such resting spots is provided for the weary pilgrims of the grip.

THE satiety which comes of indolence is worse than the weariness which comes of work. The laborer generally sleeps well.

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THE NATIONAL ASSOCIATION OF BRICKMAKERS.

Proceedings of the Third Annual Convention, held at Memphis, Tenn., Nov. 13th, 14th & 15th, 1888.

(CONTINUED)

FOURTH SESSION, TUESDAY, 9:00 A. M.

Vice President Ittner called the Convention to order.

The Chairman—Before proceeding to active business this morning, I wish to make this suggestion: That in the discussions following the different papers that will be read, that instead of a member's being catechised while he's on the floor during his four minutes' speech, that the members wishing to put questions, wait until he has finished speaking, at the end of which time, they can then put their questions. It would make the entire proceedings look more in harmony than by putting these repeated questions in a disjointed and an awkward sort of way. I desire to make that suggestion at the outset, and I hope the members of the Convention, as we get along in our proceedings, will conduct themselves accordingly; and, furthermore, it appears on the programme that we have a *Question Box* and any members desiring to have information and desiring to put his question in writing, can drop into the box which will be opened and the questions taken out and read in their proper order. [Addressing Mr. Randall] Mr. Secretary, have you got any matters that you wish to speak of?

Mr. Randall—I don't know, Mr. President, there's a paper here and some communications, but I think they ought to come under the head of miscellaneous business in the final session.

The Chairman—The next on the programme, gentleman, in its regular order, is a paper by Prof. Carpenter, of Lansing, Mich.—'The Evolution of the Brickyard.' He is now arranging his papers and is not entirely ready to be heard, and in the mean time there's a paper by Mr. Campbell, of Kansas City, Mo., that our Secretary will read while Prof. Carpenter gets ready.

Mr. Randall—This paper is the 12th number on the programme—'The Dry Press Process For Common Brick.' Mr. Campbell has been among us until this morning, but he received telegrams calling him home and had to leave on the morning train—is probably now on his way to the station; and he has given me these papers to read for him. He expected to revise this paper and deliver it in person; so he hopes you will excuse any shortcomings in the paper on that score.

"THE MANUFACTURE OF COMMON BRICK BY THE DRY PRESS PROCESS,"

BY D. W. CAMPBELL.

I presume every brickmaker here is familiar with the modus operandi of the making of brick from dry clay. How the clay being lightly plowed is allowed to dry, and then gathered into large storage sheds, where from a combination of causes it goes through a sweat giving it a sufficiency of moisture to be adhesive when placed under pressure by machinery.

It is not my intention at this time to enter fully into the details covering the making of a dry press brick. I simply wish to give a few facts which may impress you as being a saving and advantage over other modes of brickmaking.

The clay, being in store, is run directly to the kiln from the machine. Thus avoiding:

1st. Loss and cost of repeated handling.

2nd. Cost of dry room and operating same.

3rd. Loss by reason of exposure to weather.

4th. Loss of time by inclement weather.

The brick are of a superior quality from the fact of the greater quantity of clay being used to make them, but which I must acknowledge adds to the expense and difficulty of burning.

There is, however, an offsetting advantage gained which in my opinion is of considerable magnitude, viz., that brick by the dry process can be manufactured ten or eleven months out of the year, or even the entire year, if necessary. True they may not be marketable during the winter months but who of us do not experience great difficulty in filling our orders in the spring, at even advanced prices, and labor where employed during all kinds of weather the entire year can be secured at the lowest price and to the best advantage.

It has been proven that a brick made by this process will sustain a much greater weight than a mud brick, which, whether absolutely essential or not, is a fact which cuts quite a figure when dealing with intended purchasers.

I shall not, as I said before, attempt to go into the details of this subject for this reason, 'seeing is believing,' and as your President and committee have favored the question of accepting the Kansas City invitation to hold their next meeting there I shall withhold the interesting information until that time, and shall then take great pleasure in going over the matter with you individually.

Kansas City as a city is the greatest wonder of the age, and has done more to advance the interest of brickmaking by using and paying liberally for all the brick that could be manufactured there than any city in the country.

I am the bearer of an invitation to you all to come and see us there, and if accepted you will find our doors wide open and with our hearts in our hands we shall greet you.

The Chairman—Gentlemen, the paper just read by the Secretary is now before you and open for discussion. Remarks are now in order, and, as on previous occasions, I hope that each gentleman arising will give his name and place of residence so that the reporter can get it in without confusion. If there is no discussion to follow this paper, Mr. Carpenter, I presume is now ready to proceed with his paper. Prof. Carpenter, of Lansing, Mich., will now be heard.

Prof. Carpenter—Mr. President and gentlemen of the Convention: I have no doubt the Secretary selected me on the principle that I was an old fossil and would be the best one in the Convention, therefore, to present this fossilized subject to you. I shall, however, try to be brief and present the subject in a very short time. Have you considered a moment to see what the subject of the evolution of the brick yard covers? It seems to me it covers the history of brickmaking. I will read you what I have.

"THE EVOLUTION OF THE BRICK-YARD," BY R. C. CARPENTER.

The doctrine of evolution, or gradual growth in perfection, is accepted as explanatory of the mysteries attending the origin of species in Zoology and Botany. The same doctrine is not admitted to apply by many people when the subject under consideration is man. But whether the doctrine in this case is or is not applicable, whether our remote ancestors were monkeys, or apes or baboons, or whether we have even improved, mentally, physically or morally since the days of Adam, does not concern us in the investigation we have in hand. It is my pleasure to say a few words regarding the evolution of the process of brick making. There is probably no art or industry known, but what has had a gradual growth, more or less rapid, from its first inception, through various stages until it reaches its culminating point of success and perfection. This is less true of certain fine arts, such as painting and sculpture, which seem to depend largely on an instinct, born in the individual, capable of cultivation it is true, but yet dying with the individual, but is true without controversy, in regard to those intellectual and technic arts like our own, that attain perfection by gradual growth and depends on generations rather than on individuals for success and perfection.

The art of brick making is an ancient art, but it is not so ancient as some writers would have us believe. In fact, I conclude after careful investigation, that of the very ancient nations, but one, the Chaldeans, were acquainted with this art. Many of the others it is true used dried clay, in the shape of brick, aud possessed the art of making fine pottery and glazed tiles, yet made no brick for the purpose of building as we use them to day. The art of brick making may not, in its simplest form, require as much skill as the manufacture of pottery or porcelain, but in every case it is an after art, an art of more recent birth, and the reason for this is not difficult to find. Some one has well said that "necessity is the mother of invention," and it is no doubt true that in every case, the art of manufacture has followed a demand. Now the demand for a permanent building, with a nation emerging from a savage state, would not come until the arts of supplying food and clothing and temporary shelter were all advanced. No nation is found without its pottery though the pottery may be coarse and illy adapted for use. The manufacture of pottery and often of elegant and perfect specimens extends back long before historic times, and long before the art of building required or demanded, a substitute for stone.

Before we can consider the process of evolution as applied to the manufacture of brick, it will be necessary to consider the method of manufacture used in ancient, even in pre-historic times. Indeed it seems to me that my subject belongs to the past rather than to the present and I will endeavor to show as well as the authorities that I could command will permit, the condition of the craft in past ages and the perfection attained in the art.

I think this general law will be found true, that in ancient as in later times, the use of brick has in a large measure depended upon the scarcity of other building materials, especially stone. We shall see that nations living great distances from stone quarries even in the earliest times have by means unknown to us acquainted themselves with the art of brickmaking, and have carried the art to great perfection. When stone could be obtained only with great difficulty then clay was used as a substitute, and we shall find that even during the prehistoric time, known as the 'stone age' contemporary nations living in countries where stone was difficult to obtain, made from clay all the implements, dishes and building material that other nations was accustomed to make from stone.

The origin of the art of brickmaking, including the contemporary art of manufacture of pottery will be found, with that peculiar people, represented in modern times only by the Chinese, but in ancient times, by strong and powerful races, found in Egypt, Chaldea and China, in the old world and in Mexico and Peru in America. This race of people ethnologically known as Turanian, possessed even in earliest times great skill as builders. To erect buildings that would endure for ages, and that would perpetuate their records, and serve as tombs seems to have been their special ambition. That they were successful in this we have only to consider, the buildings and the ruins of buildings, yet left us in every country once possessed by this race.

"The first inventors of any art are among the greatest benefactors of their race, and the bold step they take from the known to the unknown, from blank ignorance to discovery, is equal to many steps of subsequent progress." "The child is father of the man," both in the individual and in the species; and the human race at the present day lies under infinate obligations to the genius and industry of early ages.

This particular race, the Chaldeans, were driven by necessity almost, to the use of clay and it is hardly possible to see how a people could better improve the opportunity. In the first place they had no paper, they had no substitute for paper, some genius among them discovered how easily a moist clay tile could be impressed with characters, and how imperishable it became when burned. The result was the formation of libraries consisting of clay tablets on which was engraved, in the peculiar form of writing employed the record or chronicle it was desired to preserve. Oftentimes an inscription extended over several bricks.

THE TABLETS OF THE CHALDEANS.

The tablets of the Chaldeans are among the most remarkable of their remains and when all are deciphered will throw great additional light on the manners, customs and religions of this ancient people. The tablets were made somewhat pillow shaped and from one inch to four or five inches in length; when in the moist condition they were written on and duly signed and attested. They were then baked, then covered with a thin layer of moist clay on which was written an exact copy of that on the inner tablet. The inner side of the envelope would bear a cast in relief of the inscription beneath it. It is hard to see the object of the envelope, unless it may have been to prevent tampering with the document on the inside. Most of the tablets deciphered are deeds, contracts or engagements, entered into by private persons. These people were also in the habit of stamping their bricks with the name of the king and this custom was also followed in later days by the Egyptian kings.

E. A. Poe, *Vice-Pres. Nat'l Brick Mfrs. Ass'n.*

CHALDEAN METHOD OF BUILDING.

Throughout the whole of Chaldea or as it was later called Babylon, stone was entirely wanting or very scarce. The nearest sandstone was probably 150 miles away, on the Arabian frontier, the road to which lay across rivers and marshes then scarcely passable. No doubt a primitive people, would be content with houses built of rushes or palm trees, but a wealthy and civilized nation as they became after a few generations, would be content with no structure unless permanent. A nation whose instincts for tomb and temple building were as strong as the Egyptians would not be content, without at least attempting to rival them in the magnitude of their structures.

The earliest traditions and the remains of the earliest buildings inform us that the material adopted was brick. The tradition in the bible informs us of the desire to erect a building that would reach to the heavens and another informs us that it was made of burned brick. The Babylonian account as given by Herodotus is as follows: "The earth was still one language when the primitive men who were proud of their strength and their stature, despised the Gods as their inferiors, erected a tower of vast height, in order that they might mount to heaven, and the tower was now near the heaven when the Gods caused the winds to blow and overturned the structure upon the men and made them speak with divers tongues."

The magnitude of their structures is attested by the ruins still to be found, as well as by the testimony of Herodotus and Strabo, both of whom visited the country while it was prosperous. Some of the ruins are still over 100 feet high and surrounded with sufficient debris which has fallen from the upper part to easily have made them two or three times the present height. We are informed by Rawlinson that an excellent clay was found throughout this region. This when exposed to the intense sun heat of that region for a sufficient time, or still better when kiln burned, became a tolerable substitute for stone. The baked bricks even of the earliest times are still sound and hard, whilst the sun-dried bricks, though they have often crumbled to dust or blended together in one solid earthen mass, yet sometimes retain their shape and original character almost unchanged and offer a stubborn resistance to the excavator. In the most ancient of the Chaldean edifices, as the Bowarigeh ruin, we find only the unburned brick, but usually the building is completely covered with a facing of burned brick, sometimes the facing alone being 10 feet thick. The size and color of the brick vary, the general shape is square or nearly so. The thickness as given by Rawlinson is as follows: the earliest baked brick of Chaldea, and no doubt of the world, are 11¼ inches square by 2¼ inches thick, the baked brick of later date are commonly about

13 inches square by 3 inches thick. The unburned brick varied in size still more. They are sometimes as long as 16 inches square by 7 inches thick. Beside these regular-shaped brick, triangular brick are found for use at the corner of the walls, the wedge-shaped brick were found in arches. The arch was in common use by this people to form the covering for their drains or sewers. In cases where sun-dried brick were used for the outer facing of the walls a row of rushes formed into a mat was arranged in horizontal lines at intervals along the building to protect this brick from the weather. I have been unable to find any description of the method of manufacture of brick in these earliest times. We know from the description in the bible and by the ruins, that brick of excellent character were molded and burned. We know both from the bible and from monuments how unburned brick were made at that time in the neighboring county of Egypt. Those brick, however, were inferior to these, as except in rare cases they seem to have been merely sun dried. During the later ages of the Chaldean empire the art of brickmaking seems to have become highly developed.

The skill of a nation in the working of clay is however shown in its pottery more than by its brick, and in this art these ancient people are not to be despised. In the early Chaldean empire rude vases, exhibiting little elegance of form and no beauty whatever are common. The vases and drinking vessels of the latter period are however as elegant in form as those produced in the latter ages of the Greek empire. Whereas the first-named was made of coarse clay intermixed with straw, the latter was made of clay rivalling in excellence our kaolin. This peculiar nation was so devoted to the use of clay that even after life was spent, the body was enclosed in a clay coffin and the head of the corpse was pillowed on a single sun-dried brick. These clay coffins are remarkable, and from their great size and peculiar shape would present many points of difficulty in construction, even to potters of our own time with all their appliances.

The body was placed on a mat which in turn rested on a platform of unburned brick, around the body was disposed various utensils and ornaments. Both body and utensils are then covered by a high cover commonly 7 feet long, 2 or 3 feet high, and 2 feet broad at bottom. These covers were ornamented but slightly on the outside, but inside were plain; children being buried in smaller coffins. Another form of coffin was formed by placing two jars mouth to mouth and sealing with hot bitumen, each jar was about 2 feet in diameter and 2½ to 3 feet in depth. In each coffin there is an air hole to allow the escape of gases. The dead were commonly buried in extensive mounds, the coffins being arranged in horizontal layers and often separated by walls of masonry. These mounds were drained by a remarkable construction in clay extending from the top to the bottom.

These drains are covered on top with a series of perforated bricks and surrounded for the thickness of a foot with pieces of broken brick. The tiles about 2 feet in diameter have a convex form near the end to give them greater strength, and the top ones are perforated so as to receive all the moisture. These drains have been so effective in carrying off moisture that the mounds have preserved even to the present day the skeletons of this ancient people nearly in a perfect condition.

The city of Babylon, though principally rebuilt about 700 years B.C., was a brick city, containing at one time a population certainly larger than that of Chicago to-day, and possibly rivalling that of London. It is not doubted that it covered about 100 square miles of which however not more than one-fifth or one-tenth was covered with houses, and it was surrounded with a brick wall 300 feet high and 85 feet wide at the top. [Enc. Brit. Vol. III.] These dimensions were given by Herodotus, and investigation merely seems to show that they were reliable.

"The clay dug from the moat served for the bricks of the walls Herodotus says these bricks were burned in kilns. The walls were pierced for 100 gates, all of brass with brazen lintels and posts, and with two minor enclosures faced with enameled bricks which represented hunting scenes. Two other walls ran along the banks of the Euphrates and the quays with which it was lined. Each contained 25 gates, which answered to the number of streets they led into. Ferry boats plied between the landing places of the gates; and a draw-bridge, 30 feet wide, supported on stone piers, joined the two parts of the city together.

At each end of the bridge was a palace, one of which was a building of almost unequalled magnificence and size. The most remarkable edifice was the temple of Bel, now marked by a ruin called the Babel. It was a pyramid of eight square steps, the basement step being over 600 feet each way the top step containing a colossus statue of Bel.

A similar temple stood at Borsippa the suburb of Babylon. It consisted of seven steps, each ornamented with one of the planetory colors, the azure tint of the sixth, the sphere of Mercury being produced by the vitrification of bricks, after the steps had been completed.

THE EGYPTIANS.

You are all doubtless familiar with the efforts of this pioneer race in the line of brickmaking and remember well the poor success they had, when their Hebrew laborers went on a strike. The Egyptians however made only sun-burned brick, or at least they made burned brick so rarely as to have escaped the notice of their own historians and of our later day explorers. The method used in the manufacture of bricks is well known from the inferential description in the bible and from the description on the monuments. In the manufacture of pottery common and glazed, and also in the manufacture of encaustic tiles, the Egyptians were fully or nearly as advanced as to-day. They also manufactured very beautiful and very perfect porcelain.

BRICKMAKING OF GREECE AND ROME.

It is very probable that both of these nations were acquainted with the use of burned brick, but it is equally certain that they were rarely if ever used by the Grecians, and only by the Romans in the later days of the Empire and since the beginning of the present Christian era.

The noted buildings of Greece are constructed of marble, which was very convenient and easily quarried, but a study of the History written by Herodotus, about 450 B.C., leads me to believe by his incidental references that he was acquainted with the use of burned brick. Had his readers been entirely ignorant of the process of manufacture of burned bricks he would have been likely to have given the method of manufacture of the Babylon bricks in full.

It is quite certain that for several centuries the process of manufacture of burned brick was not practiced by the most civilized nations of the world. The work of Vitruvius, a Roman architect, written at the time of Augustus Cæsar, the most glorious period of the Roman Empire, describes in full the various methods of building employed at that time, and the method of preparing the material used in building.

He gives a long description of the method of making sun-dried brick, but he evidently never heard of the use of burned brick or they would have been mentioned. It is quite certain that Vitruvius was a successful architect, and in a position that would make him fully acquainted with all the materials in use for building at that time. I will read you an extract from Book I, Chapter III of Vitruvius, explaining the method of manufacture of bricks: "Gravelly pebbly and sandy clay are unfit for that purpose, for if made of either of these sorts of earth, they are not only too ponderous, but walls built of them when exposed to the rain would wear away and soon decompose and the straw also with which they are mixed will not sufficiently bind the earth together because of its rough quality. The proper seasons for brick making are in the spring and autumn because they then dry more equally. Those made in the summer solstice are defective because the heat of the sun soon imparts to their external surface an appearance of sufficient dryness whilst the internal parts are in a very different state, hence when thoroughly dry they shrink and break at these parts which were dry in the first instance. Those are best that have been made at least two years, for in a period less than that they will not dry thoroughly. He states that unless thoroughly dried, plaster will not adhere to them."

It is not, therefore, without reason that the inhabitants of Utica permit no bricks to be used in their buildings which are not at least five years old, and also approved by a magistrate.

There are three sorts of brick, the first is what the Greeks call Didoron, being the sort we use, that is one foot long and half a foot wide. The two other sorts are used in Grecian building the one called Pentadoron, being five palms each way, and the other Tetradoron, which is four palms each way. All kinds of brick have half bricks to suit. Vitruvius then describes how the bricks are bonded in order to give the wall a uniform face. He also describes a brick made of a light earth that when dry will float on water.

There is no doubt that in the later days of the Roman Empire the art of burning brick was again acquired, they learned also to make roofing tiles and drain pipes of clay. The brick made in this period are equal in every respect to those made at the present time but we are in ignorance of the methods used in their manufacture and of the style of kiln used to burn them. During the middle ages, no doubt our art suffered in common with all the building arts, but when the time for accurate history again appeared we find evidences that the brickmakers well understood the art of producing strong and well burned brick. From that time to this the art of evolution has had full sway, not however, acting so much to improve the product, as to improve the process of manufacture. We have seen how the ancient Egyptians molded brick, and dried them on the ground, and called them fit to use. In the three thousand years that have elapsed since then what have we done? Go to most small towns and you will answer we have invented a rude machine for grinding the clay, instead of tempering with a stick, otherwise we do as did the Egyptians. Go to other cities and you will say we have done more, as we have in addition a machine that fills the molds, otherwise we do as did the Egyptians. Now I believe I do not exaggerate when I say that fully one half the brick used in this country are to-day made in this way and consequently our evolution for such cases has stopped with the two inventions, the pug mill and the soft mud machine, just mentioned. This certainly does not seem complimentary to the genius of American inventors, but such is the fact. The existence of this condition of affairs is due not to the want of machinery for the manufacture of brick, so much as to the prejudice existing against the brick made by machinery. This prejudice is not entirely without reason, due principally to the fact that the clay used for machines is not properly tempered. The machines referred to here are the stiff mud machines. These machines are largely used in many localities, and unfortunately possess the power of manufacturing, whether the clay is tempered or not. The clay is delivered from this class of machinery with a consistency, sufficient to allow of some handling when fresh from the machine. I know nothing by experience of the dry clay machines, but I have unbounded faith in them. I have not seen any dry process brick, except a few on exhibition, but I do not doubt that the quality of such brick is unsurpassed. In regard to the brick made by hand or in a similar way by the soft mud machine, as compared with the brick made by stiff mud machines, I will say that a number of tests which I made this past season of bricks made from the same clay, but by the different processes have shown somewhat in favor of the soft mud brick, and this is all the more surprising from the fact that the machine brick were harder, gave a clearer note when struck, and so far as external appearances are concerned were the better brick. The machine brick however were not as homogeneous. they contained less sand, were poorly tempered and the experience of use has shown them decidedly inferior to the soft mud brick, in resisting the influences of the weather.

C. P. Merwin, *Recording Sec'y Nat'l Brick Mfrs. Ass'n.*

TABLE OF TEST OF BRICK.

Locality.	Area in inches.	Depth.	Strength per inch, First crack.	Strength per inch, Crushed.	Machine.	Remarks.
LansingCo.	3¾x7¾	2⅛	500	1378	Kells.	White b
Brick Yard	3x3¼	2¼	527	2400	Sword.	On side
" "	2½x3.7	2.1	775	2700	"	" "
" "	2¼x3⅞	8.1	942	1521	Penf'd s.e	On end.
" "	3x2¼	4	1888	1944	" "	On side
" "	4x2¼	8	1110	1490	" "	On end.
" "	3x4	2½	916	3500	Hand md	On side
" "	3x4	2¼	1888	1250	Soft Mud.	" "
" "	2½x2½	2.3	1280	3840	" "	" "
" "	3½x3.9	8⅛	2060	2517	" "	On end.
Appleton's	4x4	2¼	937	2374	Penfield.	On side
Brick Yard	3x4	2½	833	2666	Sword.	" "
" "	4x4	2	625	1582	Soft Mud.	" "

NOTE.—Since writing the foregoing I have made a few tests of well tempered brick made on stiff mud machines, although unfortunately not from the same clay as the previous tests, the results emphasize the necessity of thorough tempering. as the strength ran higher than those previously tested. The strength was over 4000 pounds per square inch, while one specimen stood over 5000 pounds. Such brick are no doubt superior to the best hand-made brick.

Now I believe this difference to exist through no fault of the machine, unless it may be a fault that its capacity will permit the production of brick from clay not properly tempered. With clay properly prepared there is no reason why the bricks produced from this class of machines will not compete both in quality and strength with those made by hand. Our process of evolution has not yet carried us so far as to be able to produce a brick by machinery. Our Chicago yards however are excavating by machinery, pugging and molding by machinery, transporting in part by machinery, drying by steam heat, burning by petrolium and reducing the labor of handling more and more each year. In time, our process of improvement may carry us so far that all these processes from first to last shall be done by machinery, shall be done automatically and shall be done perfectly.

There is one particular in which our art can claim great influence and great benefit from evolution of brick making machinery, and humanity should offer more thanks for this one thing than for all others combined. I refer to the improvement of the condition of our laborers, you have seen what it was in the time of the Egyptians; it was no better in the latter days of Rome, when foreign slaves labored for Roman task masters. You know what the condition was in your own yards when the old hand process was in vogue. I know what it is still in yards run on that plan, and know in many instances women, children not yet strong, do the hard and degrading labor inseparable from that process of brickmaking. The machine (stiff mud if you please) in performing operations formerly done by this class of labor, liberates those people, it knocks off the fetters of slavery which had bound them to a task for which they were not fitted, and it should be regarded by all humanity with as much favor as the emancipator of slaves.

During the reading of Prof. Carpenter's paper, an invitation to visit the Chickasaw Armory in a body that night, was read by Mr. Randall, and on motion of Mr. McCain, was accepted and the thanks of the Association returned to those extending the invitation.

DISCUSSION.

The Chairman—Gentlemen, discussions are now in order on the paper of Mr. Carpenter.

Prof. J. F. Elsom, of Indiana—I would ask the Professor, Did you pay any particular regard as to the manner in which the clay was put in the moulds, in making your tests—whether the strata was edgewise or flat?

Prof. Carpenter—In the hand-moulded brick, the clay is thoroughly tempered; it's surface clay.

Prof. Elsom—I mean in the clay that was not tempered.

Prof. Carpenter—This clay was shoveled directly from the bank into the machine. Now I would say this in regard to the color. This is a peculiarity of our Lansing clay. Our top clays are red invariably. These two bricks were made on different machines.

Mr. Purington—That brick, anyone who ever saw a brick made by that machine, wouldn't need to ask what machine it was made on. It's a machine manufactured at Lansing, Mich., about the size of a nail keg. I've always seen the clay shoveled right into it. I happen to know because I happen to be spending some $300 repairing a building that was built of brick made on it, and I am coating it outside with a new coat of brick. The result would probably have been the same with any clay dug right out of the bank and jammed together in the machine. Yet I am inclined to think that that machine, with clay properly prepared, would make a durable, serviceable brick.

Mr. McCain—What was the name of that machine?

Mr. Randall—Mr. President, it has always been the practice and understanding that machines should not be mentioned by name in the Convention; to do that would involve us in an interminable discussion, as the same machine may have worked well in the hands of some men and not given satisfaction to others.

Mr. McCain—One moment, Mr. Secretary, just give us a chance to ask a few questions: What we can't do today, we'll do tomorrow. You decline to give the name of a machine that made this brick. I think it a very sensible question to ask and should be answered. We are brickmakers here. This is the Brickmakers' Convention and there are some of the members using machines and other members are using the machines that God Almighty gave them; they wish to be in the progressive line and of course it is in the interest of brickmakers to know an inferior from a superior machine, and in my opinion, I think the name of the machine should be stated, which can be recommended or abolished for the benefit of the brickmakers. I have got no machine. I have handled the 'Chief' machine for the benefit of that party in Denver. It don't suit me, and if there's a better one, I would like to hear of it.

Mr. Adams, of Indianapolis—I was about to call our friend to order because we have an unwritten, if not well understood law among us that we take no part—recommend no machine or say anything derogatory to the character of a machine. The only thing that would be proper on this occasion would be to mention the character of the machine on which the brick was made.

Mr. Randall—Mr. McCain, I think, hasn't considered the matter very carefully. There are good machines all over the country that are made a failure by mismanagement and yet may be in successful operation in many other places where they are properly used. If we enter upon this discussion of the merits or demerits of various machines, we open the door for unscrupulous men to take advantage of us, and for that reason, as Mr. Adams says, 'we have an unwritten law that machines will not be spoken of either in praise or condemnation.'

Mr. McCain—I may possibly be not posted in the rules and laws of the Association, but if you have got such a rule or law as an established fact, I say it is an injustice to a brickmaker. We are here for the purpose of benefiting and advancing the interests of brick manufacturers; we are not here to make money for Tom, Dick or Harry, but to make money for the members of this Association; and if I know of a superior machine that I think is a benefit to the members of this Association, I certainly will name it.

Mr. Crafts—I wish to rise in the first place to complain of my friend behind me for having taken the wind out of my sails, and my friend Randall, for having added insult to injury. Notwithstanding I think I have the best brick machine in the world, I wouldn't for any consideration, mention it in this Convention. If any one wants to find it's name, it must be done by private inquiry.

Mr. Purington—If Bro. McCain's theory should prevail, we would stay here a good while, because if we got into a general discussion of the different kinds of machines, there would be no end to it. It is Bro. McCain's theory that has ruined so many brickmakers. Some men have recommended a machine as the best in the world, and for the clay they used, it was, perhaps the best, but a machine that I would recommend would not perhaps suit Bro. McCain.

Prof. Carpenter—I just want to make a word of explanation. I think this whole thing has been misunderstood. This is not a contest between machines at all; it was simply a contest between tempered and untempered clay. There was no particular difference between the results obtained by any stiff mud machines, but the best results are given by the tempered clay; that's the whole thing.

Mr. Eudaly—I just wish to make a remark. I heard this morning a discussion among gentlemen where some one had visited a cert in place and came to this Convention reporting that certain things there had proven to be absolute failures, when on further investigation, it is found out that the very things they thought had been used at that yard, had never been in he yard at all. I have no doubt these gentlemen, if called on to express themselves on that kind of method, would condemn it. I was about to rise when Mr. McCain, of Denver, got through with his remarks. It would never do in the world for us here as a Convention, to speak of machines by name, either meritoriously or otherwise. The very information that Mr. McCain wishes, he should have, if he seeks it, but it should not be got in the way that he anticipates getting it.

Mr. Purington—He can get that by applying to Bro. Crafts, [Laughter] or by private inquiry.

The Chairman—The further order of business is discussion on Prof. Carpenter's paper, if any one desires to speak on the subject.

Mr. Gates—I think there is one thing we all can agree on right here, and I wish to move that a very hearty vote of thanks be tendered Prof. Carpenter for his able paper. (Motion carried.)

Prof. Elsom, of New Albany, Ind., read his paper.

"EFFLORESCENCE ON BRICK—IT'S CAUSE AND CURE," BY J. F. ELSOM.

Mr. President and Gentlemen of the Association:—It is with feelings akin to those of the boy, who, on being requested by his father to set a hen, placed one dozen Pike's New Discovery kiln models beneath her "in order to see the old fool spread herself," that I stand before you on this occasion, to present a few thoughts regarding the 'Efflorescence on Brick,' to this end I have made many researches to ascertain the cause, and so far as possible in a laboratory traced out remedies.

First, in order that we may fully understand this important matter, the words of our subject must be separated by lines drawn deep and wide, from all others, then be subjected to crucial tests to avoid confusion, thus precluding the possibility of that dashing of prejudices far too common in meetings like these. Upon investigating I find efflorescence and crystallization divided by lines of demarkation drawn so narrow and thin as to be scarcely discernable by the most astute and absolutely invisible to the casual observer, thus, at the last meeting of this august body, I, to my regrets, find "papers not a few that seemingly touched tender points in papers many," caused, I might say, more by a misinterpretation of the technical features of my subject to-day than all other causes in the aggregate. My friends, I have no biased views of this matter, but pursuant to the requirements of your Executive Committee, I have considered it from the standpoint of the analytical chemist, but, let me whisper, "there is a chile among ye taking notes," and Mr. Theodore A. Randall, the Editor of the Clay-Worker (a paper we all like) and the scribe of your convention, takes special pride in rapping my knuckles now and then—more in pity than in anger I know—hence, as one of my countrymen once said in his pulpit, "I say these few words before I begin to speak."

This efflorescence, then, of which we speak is nothing more or less than one of the primary efforts of nature to establish an equilibrium, for, be it known, in chemistry we have a certain proportion of moisture which we call water of crystallization which nature decrees as necessary to hold the atom and molecules of any substance in their proper order and condition as regards each other, hence is part and particle of such substance and is so considered by all. Next, nearly all the older elements of chemistry are more or less hygroscopic, that is possess the power of absorbing moisture other than that of crystallization, before alluded to and partially described, and is considered as as an extraneous substance by the analyst, being reported as such in our certificates, this water, however may be added and subtracted *ad finitum*, some substances and combinations absorbing more and some less by each process; not so with the water of crystallization, when this is once learned—it cannot be increased by any means known to science nor will be until water and oil will mix, oil of itself is largely composed of water, its water of crystallization, but it will not absorb extraneous moisture, when the water of crystallization is by any means made less, it cannot be replaced, but any substance or combination so acted upon will show by analysis this much less of its own water, and must be treated accordingly in subsequent processes, a point that should be well understood by brickmakers, for in seasoning and burning it is very important they should know just where extraneous water ends and the water of crystallization begins, particularly in fine goods.

The substance we call clay, out of which you, my friends, construct articles of utility and ornament, is amendable to this law in an exaggerated degree, we add water and make the hard clay soft, we temper in water, and disintegrate even the rough brick from adhering sulphur clay by means of water, it is water, water from the time we begin to dig until the dry kilns are reached, where the cubes are placed and nature's heat expected to rid them of this extraneous moisture, in many instances trusting to the sense of feeling alone to tell us when this has been accomplished, then we move them to the burning kiln and by artificial means we remove the water of crystallization, and the brick, never to contain water of crystallization again are ready for market and should remain forever free from crystallization and efflorescence and would be if clays were all alike, and this knowledge of extraneous and combined moisture was common to all manufacturers.

A few moments ago I called the substance clay, clay is alumina, alumina is a plentiful but very expensive product, and is the ultimate origin of many laboratory reagents, then your manipulations, my friends, are not of a common substance, but a combination scarcely found alike in two places, aye in the same deposit, nevertheless all of you, representatives from all parts of this country of ours, noble and grand, make good brick, but I venture the assertion no two work closely enough to a single rule to make it sacred, it follows then that this efflorescence can be the result of but two main causes, difference in the component parts or factors in the combination used, and difference in the modus operandi of manufacture, causes few in number but multitudinous in subdivisions and mighty in their effects.

In order to present the subject in shape I invite your attention to two analyses, taken at random from my laboratory records, but presenting a wide difference in result.

TEST NO. 45.

Silica	42.17	parts.
Alumina	34.26	"
Ferrous { Carbonate Oxide	10.74	"
Lime	2.13	"
Magnesia	4.10	"
Water—combined	1.00	"
Water—extraneous	2.00	"
Sulphur	.66	"

J. J. McKenna, *Treasurer Nat'l Brick Mfrs. Ass'n.*

TEST NO. 108.

Silica	60.18	pr. ct.
Alumina	18.13	"
Ferrous { Carbonate Oxide	2.00	"
Lime	10.00	"
Magnesia	6.00	"
Water—combined	1.00	"
Water—extraneous	2.00	"
Sulphur	.69	"
Making	100	

These two samples of clay from regular customers of mine, and members of this Association, produce an excellent quality of brick, and ordinarily made, but when, as has been done in both cases, pressed brick and sewer pipe were made from this clay, with such additions as were necessary to form a proper combination, we found efflorescence followed exposure, to trace out the cause of which was found by no means a juvenile job or cheap experiment but I will ask your indulgence while I examine a few of the constituents of these clays, and, lest I weary you will be brief.

Silica, as we find it in clay is in the form of silicon dioxide, having a molecular weight of 60, a gravity of 2.6 and is not effected by acids, or the ordinary processes of brick manufacture, hence is innocent in our discussion. Alumina, we generally find in a variety of forms, but not in the form of an oxide in clays, but in corundum and emery we do.

This substance is insensible to the action of acids, but yields readily to the action of alkalies, especially caustic alkalies. A point I particularly wish you to remember as I discuss the other ingredients of clay as I find it in the ordinary brickyard. The iron, in the form of carbonate is insoluble in all brickmaking processes, but in the form of Oxide Fe. 2 O3, iron 2 and oxygen 3, when clay containing sulphates, as the majority of clays do, is subjected to the heat of the burning kiln, the hydrated oxide is formed, and is remotely the cause of the red color of brick. In this form it is soluble in acids forming salts named from the acids with which brought in contact, and may be seen as a white powder when caustic alkalies are nicer, dark, with cyanides of potash and so on to the end of the chapter, but these two are all I ask you to note as I pass on to the lime which we find present in variable proportions in all clays, this lime, calcium, is very easily oxidized at ordinary temperatures, when we heat the clay containing it the oxide of calcium Cao is formed, and is now caustic, it being infusible, combines with atmospheric hydrogen energetically, no little heat being generated by this energy, when carbonic acid is absorbed very rapidly from atmospheric contact, then the magnesia, generally found in the form of carbonate, but sometimes as chloride and sulphate, it fuses at a low red heat, but will be acted upon by water, especially in summer, and is dissolved readily in very weak acid solutions, such as may be readily found in a city atmosphere, where coal, containing sulphur, is used for fuel. As a carbonate we find it in brick made of clay containing the merest traces of magnesia, and being an alkali, it needs no chemist to tell you that a great dissolution occurs when brought in contact with acid of any kind.

Viewed from a technical standpoint, we find in all cases, the equivalent value of atomicity of any element, or combination of elements, subjected to processes as brick, tile and sewer-pipe manufacture enjoins, must be determined by the number of monad atoms with which it can combine, of the double atoms, any element or compound may take up an indefinite number, and no alteration of the combining powers ensue for each dyad atom, possessing two units of equivalency, must and does neutralize one unit in the compound it enters, introducing a third by formation, thus leaving the equivalence or combining power of the combination just what it was before. Assuming, then, that the clays as we find them, all had the same ultimate origin, and were subjected to the same influences natural and artificial, the foregoing would not only be a guide but a dictator in the manipulation of clay, but presenting the diverse combinations we have found, this chemical fact is merely a check but no aid.

Again, the substance we find in clay, called water, is amendable to certain well defined laws, and it makes a wide difference how gotten ridden of, its molecule O H2 by the loss of one atom of hydrogen, is converted into a substance analagous to chlorium, bromium and iodim, in its relation to the other elements shown in the analysis given, and when in this condition is, to all intents and purposes, equivalent to hydrochloric acid, hence when we see the action of this combination on the mortar it behooves us to have a care how and when we dry, and whether the chesions and attraction of other elements and combinations are not disturbed in ridding the clay of its water of combination, then we must bear in mind that even the extra water is never found pure in clay any more than that which we add in the preliminary processes, for even the rain which falls in the open country contains reliable traces of substances having a hurtful action on the active principle of good clays, for I have found, by means of the microscope and spectroscope, the fine salts of efflorescence (nameless for the present) sent me for examination frequently enclose mechanically in their texture particles of water by the expansion of which, when heated, the little crystals will burst, an apparent phenomenon by no means rare, and known by the name of decreptation, and the salts of efflorescence most susceptible are those found on brick, etc., made from clays containing nitrates of baryter and oxide of lead. The same quantity of water, however, may hold several different salts in solution providing they do not mutually decompose each other, and it may be accepted as a general rule that the solvent power of water with reference to one salt is increased by the presence of another owing to combination taking place between two salts, hence when two or more salts decompose each other within the narrow confines of a single brick the results are such that precipitation cannot ensue and effloresence impossible. But I must hasten on and leave these interesting and important details for another time, it being impossible in the short time allotted me to do justice to the whole, all that can be done is to draw these brief outlines.

The principle of science, then, involved in this hydra-headed subject is nothing more nor less than crystalization, and I will be pardoned for a few moments to hint at a few principles of the process. It is a well-known axiom in crystallography that all mineral substances not belonging to the octochedral system their form is their distinguishing characteristic and it is now known that there is a relative connection between the crystalline form and the composition of compounds, also that certain substances possess the property of assuming the same crystalline form and may be substited for each other in combination without effecting the external character of the clay. For example, clays containing mineral substances of the structure of garnet have been found by analysis to contain something entirely different. Crystals possessing the form and aspect of alum, so often found in these incrustations are found to be made up of sulphates of potance and peroxide of iron without a particle of aluminous earth, and I lately found some crystals from the walls of a building made of pressed brick in Chicago, which was supposed to be Glanber's salts, to be nothing more nor less than selinic acid and soda, hence would have been very easy to remedy in the preliminary work in making the brick. Another sample from this state was a rather remarkable incrustation, and was found to contain the crystallized salts of sulphuric, selinic, chromic and manganic acids. Iromorphus substances have often very close points of resemblance, regardless of form. Thus clays containing phosphoric bares, as in some of the seaboard southern states, may be mistaken for arsenous acid. A similar analogy is found to exist between selecium and sulphur, both being fusible at the temperature of the burning kiln, volatile, and combustible in nearly the same degree, forming with water colorless gases which are similar in odor and in their chemical relations, giving rise to analagous compounds with oxygen. The characters of sulphuric and selinic acids in particular are very similar, and the salts of these acids are equally allied. Sulphate of soda has the unusual property of being less soluable in water at 212 than at 100, and the very same peculiarity is observable in siliciate of soda. The same intimacy is found to exist between baryta and stronica, between lime and magnesia, and between cobalt and nickel.

Again, in some isolated instances, I have found the clay to contain reliable traces of efflorescing zevlite, but incrustations from this cause are generally readily distinguished from all other after exposure to the air. The mineral itself is usually found in the cavities of any laminated rocks, but in the processes of disintegration by water, frosts and sunshine, may find its way into the beds of brick clay, besides the syenite and porphyry beds yield sufficient of this lanmouite to effect the brick when exposed to the air. I have usually found this element present in clays from the lead or galma regions, but if we examine with the microscope the crystals will appear in the form of oblique rhomboidal prisms, though occasionally in lamillar masses this incrustation has a yellowish white color, transparent with a vitrous lustre when in the sun, eventually becoming opaque and pulverulent on exposure, especially on the southern exposures By subjecting to analysis the following is the average results:

Harduirs	3.5
Gravity	2.3
Silica	51.98
Alumina	21.12
Lime	11.71
Water	15.05

Hence would come in the classification of a hydrated silicate of lime, and those of my hearers who chance to use clay from New Jersey, Port George, Lake Superior and various portions along the Mississippi in Iowa, Illinois, and Missouri will do well to have the lookout for this variety of incrustation, notably in pressed brick, the great trouble with it is the extreme difficulty of grading the clays that the proportions will be such as will be effectually neutralized by the remainder of the combination.

I have repeatedly been asked if this efflorescence is not largely due to the mortar used in holding the brick in position to which I have answered both yes and no; yes, when actual analysis of the precipitate shows the same elements found in the mortar; but no, as is very often the case, when they do not agree in constitution. When the mixture of caustic lime, sand and water has been properly made, a perfect silicate of lime formed, and the walls put up in a proper manner, presupposing the brick to be in proper condition, I defy the powers that be to produce by evaporation or any other action a substance of the combination usually characterising their incrustations simply because they are not to be found in the mortar free or combined.

I will freely admit that sometimes we find these incrustations of such a character as to arouse suspicions regarding the origin for instance. Since beginning this paper my attention has been called to a sample of incrustation from a wall-facing in Chicago that would naturally suggest the mortar as the cause. The sample shows:

Oxide Iron	2.14
Lime	1.68
Potash	.08
Magnesia	14.51
Sulphurous Acid	32.42
Water, extraneous	36 33
Water, combined	12.78
Making	100.00

Mr. President, abuse science as we will, pity its struggling votaries as we may, smile at its seeming idiosyncracies as much as we like, abuse its startling disclosures to our hearts' content, have compassion on the cringing poisoner if we choose, old chemistry is a dear old study still. Its childhood pinafores, and wild tangled puzzler are being passed, and now as a sturdy youth goes forth on its rambles again, but not to stop and wonder at those things, now simple, which caused sweating brains and despondent hearts in the days of Auld Lang Syne. It is not consistent with the present condition and strength of chemical and physical science to attempt to reconcile the above with the mortar used as cement. In many instances dolomite limestone is the base of lime, but in order to admit to this class our geologists demand nearly one-half or 46 per cent. bi-carbonate—not sulphate, mind you—of magnesia, and in this proportion is unfit for making mortar. Supposing, however, such stone be used, when the lime is thoroughly slacked we have the hydrate of the protoxide of calcium, and all the water needed for slacking being used at once. But I will add just here, if less than is required to convert all the lime into a hydrate be used, it will cause a granular powder to be formed, which will eventually show itself on the surface but not in the form often agreed as has and will be further shown when plenty of time has elapsed for the hydrate to form, not less than 48 hours, then made pasty with water and sufficient sand added to take up all the paste, i. e., the interstices between the sand grains all completely filled with mortar, say three of sand one of paste, or thereabouts, according to coarseness. In this condition, when brought in contact with the brick in proper condition, the hardening or setting will ensue without shrinkage and consists simply in the slow conversion of the hydrate of lime into the carbonate and silicate and the deposit of crystalline hydrate.

If we examine carefully the chemical reactions that ensue in the drying and subsequent exposure, made and applied as outlined, it will be found that the action of alkaline silicates upon lime, after being carbonated, combines with a certain portion of silica, if present in a soluble condition in combination with an alkali, forming a silico-carbonate of lime. Old mortar will yield lime water when digested in warm water, showing that caustic lime is always present, while I found some portions of old mortar to effervese in dilute hydrochloric acid, yielding a stiff jelly, showing conclusively the presence of a soluble silicate of lime, beside which mortar increase in their proportion of soluable silicate of lime with age, and there being no chemical affinity between the component parts of burned brick and this element, even if the incrustations were largely composed of it, hardly probable, it would fall down or be removed by winds and rains by virtue of non-attraction and lack of cohesive properties.

My friends, these are no pet theories of mine; I do not appear before you as an orator and with fine rhetorical flourishes strive to ridicule the ideas of others to better advance my own. The trouble has been, and now is, competition has striven to place the cause at the doors of those whom they desired to beat in the race. We must go behind all this and trace out the cause, basing argument upon such foundations that will overlap on no man's land. It has been proven and shown conclusively that the process of silification not only ensues in mortar made of lime and sand, but that it takes place in a rate of process pretty constant, which appears somewhat independent of the degree of carbonization attained by the lime.

In the calcination of lime, no matter whether in the brick or mortar, when just sufficient to expel the carbonic acid from the carbonate of lime, a silicate and an aluminate will be formed which is to be written

$$\begin{array}{ll} \mathrm{Si,O\ 3} & \mathrm{3\ Ca\ O} \\ \mathrm{Al2,\ O\ 3} & \mathrm{3\ Ca\ O} \end{array}$$

which, when we have added water becomes hydrated and is written

$$\begin{array}{lll} \mathrm{Si,\ O\ 3} & \mathrm{3\ Ca\ O} & \mathrm{6\ H\ O} \\ \mathrm{Al2,\ O} & \mathrm{3\ Ca\ O} & \mathrm{6\ H\ O} \end{array}$$

But mark well the following: If the calcination has been effected with intense heat, so as to produce partial vitrification, the reaction will become more complex, silicate of alumina and silicate of lime being formed first, after which, when brought in contact with water, decomposition ensues with the formation of hydro silicate and hydro-aluminate of lime, each containing three equivalents of water instead of six, but even then the incrustation would not be permanent, though by the united action of an atmosphere impregnated with sulphuric acid may form a sticky substance on the outer wall, which, at a distance, would resemble this hateful and unsightly incrustation. I have not time, however, to discuss the question of mortar in detail, only in so far as relates to this subject of wall coatings, suffice it to say that among builders and contractors it has been good policy to add a certain quantity of alkali, either soda or potash, to bring the mortar up to the desired proportion which should be three or four per cent. of the whole, in which manner a soluble silicate to act on the lime while settling is formed.

Again, if the trouble is traceable to the clay, the raw material must of necessity contain the bases out of which the incrustations are formed. I have called your attention to the elements usually found in clays, and the faces before me indicate intellects that will readily grasp the outline. If sulphate of magnesia appear in one sample of clay the same as in another, and is the direct cause of incrustations, brick from both yards, subjected to the same influences will show the deposit on exposure, hence it is the height of absurdity to argue a kink or secret of manipulation which will preclude the possibility of its appearance I care not how treated, unless the clay containing the original base of oxutated salts, has received some addition which render the chemical reactions impotent in this respect, the white frosts are bound to show. I am fully aware that I am laying myself liable to trial before the bar of an antagonistic voxpopuli, but a noble science teaches I am correct.

The creature now has found a tongue. All are right and all are wrong. I will frankly add that in the records of my laboratory I find many evidences, which, at first glance, would seem to corroborate each and all arguments I have seen put forth regarding the cause of efflorescence on brick, nevertheless, so long as we find these incrustations to differ in composition, so long will this diversity exist, and people look at the matter from different standpoints. If the elements of one incrustation are found in the clay, of another in the mortar, of another in the atmosphere, why we must hold each, respectively, responsible, but when, as in many cases, some of which I have hinted at, all three and even more agencies have been at work, we can not cut and make a single garment that will fit every one; it will pinch in one place and be loose in another. In conclusion, then of this part of my paper I will ask, first, have all these arguments been based on one variety of instruction? Second, were the chemical analysis made by one and the same chemist, or by chemists of equal authenticity and expertness, and, thirdly, (I wish to ask this in the faintest whisper lest a competitor hear) have not some of our friends been just a little biased in favor of their own or a friend's output, did they not think the brick of a competitor a trifle more liable than their own? My friends this is but natural, who will chide one for thinking his own the best? Thus it will be seen, as I said at the outset some little clashing of prejudices has existed, more by failure to reach far and wide enough in explorations than from selfish motives I'm sure, as I have found from actual experience with many of you but time passes and I must hasten through with what I have to say.

It has been pretty generally understood that in addition to hinting at causes I am to suggest remedies for this existing effloresence. I approach this feature of the subject with great solicitude, inasmuch as it will be necessary to call attention again to the importance of the services of the chemist to a much greater extent in the manipulation of clay. When the thought of answering a query like this occurs I am reminded of the pious brickmaker, who, so ran the tale, after attending a convention of his craftsmen in a certain city justly celebrated for its hospitality, was induced to attend a banquet in honor of the occasion. He went, and during "the feast of reason and flow of soul," inadvertently partook too liberally of the liquid cheer furnished by the generous hosts, so by the time the deacon brickmaker started for his room he was in a peculiar frame of mind; he sought his couch, and after carefully placing his shoes on the hat rack, his hat outside the door for the porter to polish; he placed his clothes in bed, and after covering them up snugly, he hung himself over a chair back and was soon fast asleep, during which he had a dream, he dreamed of clay, of brick both plain and pressed, of tiles, of drying, burning, of conventions and chemists, but all at once he dreamed of his journey home, and while on his pilgrimage met Satan, horn and hoofs and all, up on the mountain side. To say the good old deacon was frightened would be putting it mildly, but assuming courage he said, in accents loud and clear, "Get thee behind me, Satan." Satan said "I won't, but go with me and I will show you the wonders of my world below." The deacon paused (as any good deacon would) and thought; suddenly he said "Satan, see here." "Well," said Satan. "If you will perform these acts for me, as an evidence of good faith, then I will go." "All right," said Satan, "command;" and he leaned back against an old gnarled oak tree. "Pull up that tree behind you, Satan." Satan wound his arm around the tree, pulled it up by the roots and shook off the dirt as if it had been a weed. "Well," said Satan. The deacon heaved a sigh, but said, Satan, yon mountain peak over which I have to pass on my way home, make it level." Satan stretched out his hand and the mountain top disappeared, and one vast plane was spread out before them, and Satan said "Well." The cheeks of the deacon blanched, and as he thought of the loved ones, and the unburned kiln at home, his knees quaked with fear, but knowing the invulnerable character of Satan, he thought rapidly, and as he thought the white efflorescent walls of a building made of the deacon's brick appeared, and the deacon said, "Satan;" Satan said, "Well, hurry up—the last test." The deacon said, "Satan, tell me what will prevent brick from efflorescing?" Satan wept, and turning round the deacon was alone. Satan had disappeared, his last test had defied Satan's powers.

There are diverse ways of curing, among the very best is to employ a good chemist by the season, keep him well supplied with samples, thus knowidg to a nicety when liable to occur, and taking proper steps to render impotent the power of these disturbing elements. This, however, is more a preventative than cure, but is the cheapest as well as the best of all causes we can prevent, but cures are not always certain.

If you will not prevent, the cause being known, the following are the best applications: Washing the wall first with a strong soap solution and then with alum, or wash with water glass—silicate of potash. Another good plan is to soak the brick so as to cause the surface to imbibe a quantity of oily or fatty matter which prevents the advent of the elements that favor crystallization. In England with exceptionally fine-work, the brick, when well soaked, are each plunged in a hot solution of resin, turpentine, oil or wax, and sometimes pitch, till they are impregnated sufficient to exclude air and moisture. Another process is deduced from experiments on artificial stone. It consists of treating the surface first with silicate of potash and soda in solution, following with chloride of barium, by which means an insoluble silicate is deposited within the pores of the brick. One firm is using a copperas solution with, as they claim, good results. Sulphate of zinc applied to the wall, followed with a sulphur oil, will effectually cure.

Gentlemen, I have been a long time saying what I have, but so much is at stake in this matter of brick efflorescence that I have no apology to make, but would keep on if I dared.

I thank you, however, for your close attention, and perhaps there may grow out of what I have said, something good; if so, I am glad.

DISCUSSION.

Mr. Eudaly—I've been very much entertained by the reading of this paper—very much indeed. I think it's one of the most able productions I ever heard or read on the subject, and a great many men have been making some attempts, I think, at this question of efflorescence on brick, and a great many seem to know a great deal about it, but as yet I haven't heard or read anything that came so near to the point as this production. I think it is one of the most able we've ever had in our Association. But while I'm on this subject, as it has been already alluded to in the paper, that some of us are inclined very often to make little sport—the Professor saw proper to put that in Latin so we wouldn't understand it—that the masses might be inclined to make fun of his praises. I attempted one time to say something about a molecule over in Indiana at the Convention—

Mr. McCain—Mary who?

Mr. Eudaly—It was Molly. I believe we ought to encourage the reading of such papers. This paper will be published and while we have not been able perhaps to follow it through and read all these terms as fast as the Professor did from this paper, we should read them carefully, and if we can't make out just exactly what he means, we should go to some chemist and have it explained.

Prof. Elsom—Write to me enclosing a stamp.

The Chairman—Doesn't it occur to you that a committee of investigation is in order with reference to the remarks about the Deacon?

Mr. Eudaly—The only objection I had to the Professor's entire essay was that he left that man hanging over the chair. He may be hanging over that chair back yet for what I know.

Mr. Purington—He isn't doing it.

Mr. Eudaly—To be a little more serious:—While we have had some hints as to the best method of curing this efflorescence after it has been produced—those are all very good—but what the brickmaker wants to know is how to make brick so that they will not show any of this efflorescence. We'd like to prevent it on the wall, but prefer to know how to make brick that wouldn't in any way at any time afterwards, show the efflorescence or salts that come on the surface, and that is the thing the Professor has simply said could be done by manipulating chemical forces.

Mr. Crafts, of Connecticut—As my friend, Prof. Elsom, says himself, although there isn't a member of this Convention would suspect it for a moment, I dwell under the shadow of Yale College, and if I were to have any analyses made of clays, I think I should send to Indiana.

Mr. McCain—We have a school house built in Denver that is faced around with pressed brick and this efflorescence is exposed more under the sills than in any other part of the window. Invariably its under the stone sills all around the building. I'd like to know why that is. And another thing: What is the reason that the brick work laid with red mortar shows a great deal more of it than if laid with white mortar?

Prof. Elsom—The reason for the efflorescence showing more under the projections is because it's excluded from the ameliorating influences of the atmosphere. If it was an exposed wall, the atmosphere would have immediate contact and tend to deprive it of that efflorescence. White shows better on a red or black background than on white. There is nothing in red mortar—I don't know why I said black, I've got black on the brain. There's nothing in the elements of red mortar that would cause it to effloresce any more than white.

Mr. Purington—It has been stated by a Chicago firm that they had discovered the panecea for this evil in the use of paper between the front brick and the rest of the wall—I mean tarred paper. What I want to get at is whether by using this tarred paper the efflorescence will be prevented.

Prof. Elsom—Measurably, yes; in so far as the action of the oils and carbolic acid in the tarred paper will ameliorate the influence—that is all; there is nothing in the paper that will prevent it at all.

Mr. Randall—I think, perhaps, the Professor misunderstands the object of the paper. I think the paper will largely tend to prevent it because it tends to prevent the contact of the inner mortar with the outer mortar; the inner mortar is less pure than the outer mortar and the tarred paper separating the two would cut off communication in that way and prevent it from appearing.

Mr. Crafts—I merely wish to relate our experience. We are very fortunate; we are rarely ever troubled with what you call the whitewash coming out on the building and the only time where I have known the white to come out on our brick, was in a catholic church at Wallington, Conn., where they built these large piles; there it would come out and when the rains came, wash off again with but one exception. We can lay our bricks with white or black mortar and there's no trouble, but when we lay them with red mortar it raises the devil.

Mr. McCain—I selected bricks for Mr. Wallack—for his residence and also his barn. The barn is laid with pressed brick. The house is laid with a pressed brick probably three shades darker than the barn—made from the same clay, burnt by the same man, and in all manner handled the same; laid with the same mortar. In the barn the light brick has never showed a particle of this efflorescence. The house is covered round and round with it. I would like to know how to account for that; the only difference in the two is that the face brick of the house is about three shades darker than the brick in the barn.

Mr. Purington—My theory has always been that the generation of this efflorescence was caused by the burning; that is, it was a chemical change that took place; excessive burning produced it in greater quantities in certain manufactures of brick. We hardly ever see any efflorescence on light colored brick, but on a very dark brick, you will see it in enormous quantities.

Mr. Randall—Were the house and barn you speak of Mr. McCain, erected at the same time or at different seasons.

Mr. McCain—Same season; same time; barn first and house afterwards.

Mr. Adams, of Indianapolis—I desire to put a conundrum to our good friend from the State of Indiana. I was much interested in his paper, and as my friend Eudaly says, there has been some sport and fun made of the technical, and to us mud-daubers, the unintelligible terms which scientific men prefer to use and which to me are about as well understood as the hieroglyphics on the pyramids of Egypt; yet the subject matter is plain and comprehensive; it is a step in the right direction. I have been asked time and again by members of the craft and outside parties, what is the cause of this efflorescence?—This chemical matter coming out on the brick? The question I desire to propound is, in the State of Indiana, common brick, hand or machine made, show but very small efflorescence; yet with our pressed brick—our St. Louis brick, I will say, used in Indianapolis and the Zanesville pressed brick used there, we find a great amount of this efflorescence; more than in common brick. In a building erected with common brick, we see but little; yet in the arch of the windows, where the pressed brick is laid, and in the corners we find a great amount. Now Mr. Fletcher made pressed brick a few years and his show the efflorescence; whether there's anything in the repressing of the brick, I don't know, but its a fact that exists, and I never have heard a comprehensive explanation of it.

Mr. McCain—I wish to corroborate that statement of Mr. Adams myself. In all Denver where the stock bricks are made of the same clay, my own making, same handling all through, efflorescence has never shown upon a stock brick front, and on pressed brick, invariably.

Prof. Elsom—I rise now because you get so much I can't keep the run of it all. Just pardon me a moment, and I will endeavor to answer theoretically. Please don't take this as conclusive; but I will give you my theory; its based, to be sure, on a good many experimental tests. In pressed brick I find that first when its on the wall, there is a better surface to that brick—a smoother surface than with your rough brick; and when these salts present themselves, there is no influence that can be brought to bear by which they will be brought back; whereas, with the porous brick there may be influences within the brick that will cause them to re-absorb and eventually become impotent. That is theory; it's based however on a great many examinations.

Mr. Morrison, of Georgia—I wish to say a few words. While I have never given the subject much thought, I notice that buildings built in midwinter, fall or spring, when it's wet, are more liable to show this efflorescence than buildings built in the dry season—in the summer-time. I have seen walls partly built in the spring and the balance in the summer, and the parts built in the summer would be clean. In burning brick we know that if we have bricks that are damp in the kiln and put more heat on them before they are dry, after they are hard they have this white coating on the outside. I remember of one kiln where just two bricks in length had been set clear across the kiln, and they were set damp and the heat was pushed on them, and those two courses were whitened all over and they were the only bricks in the kiln that were. Now I wish to ask Prof. Elsom, if this whitewash is the same thing as the efflorescence that comes out on the brick after they are laid in the building. If they are identical, we know what causes it as far as the burning is concerned.

Prof. Elsom—I think they are not.

Mr. Crafts—I'm sure they are not.

Prof. Elsom—This water—what is it you call it? water-smoke. If you pay strict regard to what I said about the crystallization of water, and you will see that I drew that line of demarkation and that will answer your question.

Mr. Ittner, of Omaha—I will give you my observation. The white coming out on the bricks is caused by dampness in the brick. You speak about a hard and soft brick. You all know that a hard brick wont retain as much water as a soft brick; consequently it will go through that brick and stay there longer than in a soft brick, because you can penetrate a brick by soaking it through—a hard burnt brick wont soak a quarter of an inch. I believe if you laid your brick fit in tight joints and kept the water out, you wouldn't have this white at all. And further, I find brich work laid in frosty weather will draw dampness quicker than work laid at any other season of the year. You put up a solid wall in frosty weather, and it will stay damp for years and the brick will be wet, and you try to paper it by plastering on to the brick and the paper wont stay there. That is especially true of hard brick. With light burnt brick it wont do it because the water don't pass through. I claim that the water in the brick has a great deal to do with this.

Mr. Eudaly—I'd like to make a statement of some experiments I've tried to make with this whitewash. I at one time thought I could find out something about this whitewash business and imagined I could stop it. But to get to my experiments, I made with some white brick, not in the wall, but piled up in the yard. We were making out of the same clay a dry-pressed brick, repressed brick and mud brick, and by throwing water on them day after day to see what the result would be, I had the water thrown on the brick—kept them wet; let them dry out both in the sun, the open air and sheds. Now I found that I never could produce any of the whitewash on the mud brick that were thoroughly burnt, no matter how long I wet them or where I dried them, except a mould which was not the whitewash, of course. On the dry pressed brick that were not thoroughly burnt, it could in time, by keeping them in a shed from the sun, produce the whitewash—keeping them wet for a long time and having them dried very slowly. I could not do this in midsummer, when the weather was real warm and the brick dried faster after wetting. On the hard burnt brick, I failed in that way to produce any of the whitewash no matter how I tried them. I experimented one entire spring and summer and fall too to try to find out what this whitewash was and what produced it. My experience has led me to believe whitewash will come out on brick that has never seen any of the lime water, and hard burned brick will not produce it as well as the soft brick and with hard mud brick I failed to get any at all. I hear that in other localities it works differently; so you see it is a very difficult question and its going to be very hard for us to apply any fixed rule to brick in all localities.

Mr. Smith, of Mass.—There's two factories in Newberryport built about the same time with the same kind of brick, common water brick, and one is covered all over with this whitewash and the other is not. One stands down on the ocean and the other stands back on dry land and its always dry and red. There's a church 25 miles from the ocean up in Georgetown, a very expensive church, and they've a bad location—put it on a wet piece of land and that church is almost invariably covered with white, while a church built on the high, dry ground always looks bright. If you'd petition the Almighty to make the air all clear, you'd have nothing on this church—it comes from the ground. A good many men talk about a glass sweating because you put cold water in it; the water that collects on the outside does not come from the glass but from the air.

Mr. McCain—I wish to state that this wet air you speak about has no effect in Denver, and these two buildings I spoke of, are built on the same lot and we have no wet climate there to differ in the winter or summer, spring or fall.

The Chairman—I wish to say a few words on this question. I noticed in one of the journals of the country a year or so ago that there is an architect in Chicago that offers $100,000 reward or premium to anyone who will discover some means or some method by which this efflorescence or whitewash or white substance that appears upon the face of fine brick work, could be prevented, and I thought at the time that it was a very safe offer and that he never would be divested of his hundred thousand dollars and I thought that he thought so at the time he made the offer and possibly it was more in the way of an advertisement that he made it than for any other purpose. I think that generations and ages and cycles and worlds may come and go and this will still appear. That's my opinion. Now I wish to say further that in my experience as a brickmaker and a bricklayer, that what it is that causes this is dampness in the brick; whether it gets there by immersion before being laid, or by the dampness of the season and the frequent rains in damp weather after it is laid in the wall; and if you can keep dampness and wet from your brick, you will never find that efflorescence will make it's appearance; it is there in the bricks all the same, but it is the dampness applied to the bricks which brings it out, and until that dampness is applied, it wont come out. As a proof of this I want to state this: In common brick work in our city, whether its laid with the dry clay pressed brick or with the tempered clay repressed brick, it comes out all the same. If you wet the brick, and its universal in our city, to take and dip the brick in a pail of water before it is being laid, because they lay much easier and the water in the mortar isn't absorbed so rapidly after being laid. In some sections of the country, I'm told they lay the brick in a tub or vat and when they take them out, they are reeking with water. That is never done in common brick work, and its a very uncommon thing to see this efflorescence appear on the surface of walls in common brick work. It is not the fineness of the brick that brings it out in my opinion, because our brick, in the manner in which we make them, our nice red brick are almost as pretty in appearance and fineness as our stock or pressed brick as we call them, and where we lay them the people of our city, a great many of them, wishing to economize in a measure and have a pretty, neat-appearing wall, get red brick instead of pressed brick, and lay them in the same fashion as pressed brick and dip them in the water before they lay them and there the same result appears as in the case of pressed brick.

Mr. Smith—I desire to say, in the case Mr. McCain refers to, I wish to have him, when he goes back, to make inquiry if the brick in the residence structure were not immersed in water before they were laid, and that not being so particular with the barn or stable, the bricklayers failed to immerse their brick before they were laid? As if that is the case, that's the explanation in this particular case.

Mr. Purington—I move a vote of thanks to Prof. Elsom for his able and instructive paper. (Motion carried.)

The Chairman—Mr. Crafts, of Connecticut., will now read his paper on "Improved Methods of burning brick.

Mr. Crafts read his paper.

"BURNING BRICK," BY S. P. CRAFTS.

One of the burning questions of the day is: "How shall we best burn our brick?" I have been requested to read a paper on this subject I must confess that I do not know. But I wish to know, and this paper is written to call out all the knowledge in this convention on the subject.

And taking the axiom that "there is something to be learned from every fool," I am encouraged to do my part, after which I hope to hear from the wise ones in this convention. He who applies cast iron rules to the burning of all brick will be apt to be reminded of the experience of the doctor who summed up his experience in two cases by noting down that pork and cabbage will cure a blacksmith but kill a tailor. In other words the different conditions and character of the clays with which we work inevitably call for different treatment.

The strength of the clay, its refractory character according to the presence or absence of metallic oxides the tendency to warp or swell or whitewash or fail to give a good ringing sound when tested, all enter, as well as length of time, into the problem of what is the best means of sending to market a good, sound, well vitrified article.

Then comes the common question: "How to accomplish this result at the least cost of fuel and labor?" In the long ago measured by thousands of millions of years the divine omniscience stored away for the use of creatures as yet uncreated, the light and heat, rays of the sun in the form of fuel oil. Then came the coal measures, and afterwards as suitable to the use of the dawning intelligence of primitive man was given the forests, which more easily supplied his immediate needs. In the reverse order of this creation came their use. Afterward came coal and now after coal comes the reproduction of light and heat in the shape of fuel oil and gas, and mankind is to-day struggling with the problem of how best to control and develop the energies of these latest born or discovered but very aged infants.

As it would be a long and difficult task to give the values of different fuels in all localities, I will take the cost in southern New England.

One cord of beech wood, worth $4.00, contains 17,065,000 heat units; one ton of bituminous coal at $4.00 contains 31,227,000 heat units; four barrels of fuel oil, 40 gallons each at $1.000 per barrel, at 6 pounds to the gallon, gives us 20,160,000 heat units.

Here, then, we have data based on the cost and heat values for one locality, the variation from which will not be large from any of the brick manufacturing centers in that region, in which I include the Hudson River, New Jersey, etc.

Now, which shall we use? I do not consider gas in this paper for I do not know anything about it, and it is not practicable for most of us. The most cost for labor in burning, and the least cost for fitting up is with wood, but it involves the greatest cost for fuel. The greatest cost for fitting up, and a smaller cost for labor in burning is with coal, but with the least cost for fuel if you could utilize all the heat it contains. With oil, the cost of fitting up is more than with wood, but less than with coal unless you build permanent walls, and even then it is somewhat less and the labor in burning is least of all. But the cost of burning with oil is less than with wood, but more than with coal, unless you can utilize a much greater per cent. of the heat of the oil than that of coal. Now, it is claimed that you can get all the heat there is in the oil, at least 19 000 out of the 20,200 units, and that with coal you get but 8,000 or 8,500 out of the 14,300 units. You must remember, however, that these are claimed as proportions in the pound weights of the two fuels. When we consider the cost they more nearly approach each other; 12 pounds of oil costs five cents and 12 pounds of coal costs 2 1-7 cents, therefore to get at the relative values we must estimate the work of 12 pounds of oil and the work of 28 pounds of coal; 12 pounds of oil at 19,000 heat units gives 228,000 heat units as against 224,000 @ 8,000 or 238,000 @ 8,500.

From this it seems that there is very little difference between the cost of coal or oil unless some other consideration intervenes. But there is a consideration of the lesser expense of fitting up for oil, the saving of time in burning, the fewer hands required, and the ease with which you can increase the heat. You may keep your bricks at a dull red for any length of time and fail to burn them hard, but if you can in a shorter time with oil get the requisite temperature, then you do the work in less time and at a saving of fuel, for the radiation of the heat of a kiln in six or seven days is no small item. It seems to me that in this shortening of time and saving thereby is the principal argument in favor of oil over coal, but it becomes us to consider whether the difference of the percentage of heat utilized under a boiler when burning oil or coal will hold good when diffused in and through a kiln of brick. I do not think it will, for a kiln seems to take up all the heat of combustion in either case, certainly until the last stage of burning when the blanket of steam ceases to hold down the heat as in the earlier stages, a condition very different from the smokestack of a boiler.

In summing up I should say that wood is the simplest and most expensive in most localities, certainly in localities where the greatest number of bricks are made, but that between coal and fuel oil it is an open question yet to be determined by a longer and more thorough test.

For myself, I have used coal over four years at a cost of about 50 cents per 1000, and am now trying oil in the latter stage in burning to get a larger volume of heat and to deepen the color of brick when burned. We have just finished burning a kiln of 19 arches, containing 451,000 brick, using 67 tons of coal at $4.25 per ton, making the cost per 1000 63 6-40 cents. This kiln of 451,000 brick contains 15 ton of coal-dust as against 18 tons in the same number of brick made last year. This amount, and the height (six brick higher than last year) may account for the longer time and greater relative consumption of coal than usual; two hands do the work. We set 52 bricks high to economize the shed room, but are satisfied that 46 high is better and more economical.

In this paper I have not attempted to tell anything that is new to every one in this convention. It has been written to awaken an interest and draw from the members such data as will help us to form more just conclusions with regard to the best method and material. I should like to learn from my brother manufacturers just what they use, what it costs, and what it costs per 1000 to burn their bricks. I am willing to give all the particulars of my experience, failures and all. The wrecks that strew my path (of what I once thought would prove to be just the thing) in my search for *ultima thule* of brick burning form a debris not to be sneezed at.

The reasons given above for the higher cost of burning do not hold good, for we have since burned a kiln of 474,000, made in precisely the same way and set the same height, at a cost of 50 cents per 1000. Cause, better coal.

Mr. D. V. Purington—I was assigned yesterday to lead the discussion on

BURNING BRICK BY CRUDE OIL,

and it seems to me that perhaps now is as appropriate as any time to begin that discussion, after the reading of Mr. Craft's able paper, which is simply a chapter from his experience. I have not come here prepared to read a paper or give you any particular facts or figures on the burning of brick with crude oil, for the reason that another gentleman, who happened to be my brother, was assigned to read the paper. Circumstances over which he had no control prevented him from being here. Just before I left home I happened to receive from my superintendent of the yard in Indiana, a little note relative to a kiln of 250,000, giving the facts of the difference between wood and oil. That is the only data I have. I stuck it in my pocket to hand to my brother. I'll read that. This is really a private letter addressed to my brother; it is imperfect in one respect, and if I had asked him for it myself I should have had it a little differently. He doesn't give the cost of labor; he simply gives the difference in labor in favor of the oil. Kiln of 250,000 using wood and coal: 40 cords of wood at $2.50, $100; hauling to kiln at 25 cents per cord, $10; 90 tons of coal at $3, $270; unloading same, $7.50; cleaning up the ashes, $5; difference in labor, $10; total, $402.50, equals $1.61 per 1000 for fuel and the extra labor. That of course seems a little forced. He should have either not given the labor at all, or given the entire cost of labor. At this place where we make pressed brick, we have been unable to find any burner we could dry off sufficiently slow with oil to get the steam off without commencing to burn the brick, so we have dried off partially with wood. Same sized kiln with oil: 15 cords of wood at $2.50, $37.50, (against 40 cords wood); 350 barrels of oil at 62 cents per barrel, $217; making steam, 10 tons of coal at $3, $30; hauling 15 cords of wood at 25 cents, $3.75; unloading coal 75 cents; total, $289.00, or $1.15 per 1000; saving, $113.50. The above figures are about as close as I can get them, and nearly accurate. I have figured the cost of coal at $3 and the oil at 62 cents, which may not be exact. Now, in our yard in Chicago, common brick—and I want to say right here, that efflorescence in our Chicago brick doesn't bother us any; you can't see it if it does come out; you don't care anything about it. I have burnt this year a little over 28,000,000 without using a stick of wood or a pound of coal—entirely with oil. Of course my brick are artificially dried. We have taken out of each brick from the time it was made till it was set in the kiln, a pound and a quarter of water, so they are about as dry as can be got, practically. We start one side of the kiln three or four hours before we do the other, and we get the heat up just as fast as we can get the draft started. When we first start, of course without the arches being heated at the sides to form a combustion, we have to burn more oil. Our fire is oil, and we burn on an average four days, where the average was about seven days and a half before. I burn in kilns of 24 arches each, and where we used five men before we now use two. We have no ashes to haul away, no coal to unload. We unload all our fuel with a little steam pump, and is then ready to be drawn by gravitation from the tank to the kiln. I can state unequivocally that I know of no inducement other than a pecuniary one, that would lead me to go back to burning, common brick, artificially dried with wood or coal. I'm not up on heat units, and shall endeavor to talk in a language that brickmakers can all understand. I don't know a unit of heat; wouldn't know a dozen if I should see them right here. The cost for fuel has been, for oil, an average of 36½ cents per 1000. In the beginning before we understood oil and its uses, we used a great deal more, and we are all the time improving upon it. Any science so new as the burning of brick with crude oil, is susceptible of great changes, and I expect it to improve for the next ten years. The exact total cost of burning brick so far with me I have been unable to ascertain, for this reason—I take my steam from a stack of three boilers, and the same steam from the three boilers is used for running my machines in the day time and also for my kilns, and for burning brick, so I have been unable to divide the amount of steam I use for burning brick, and the only way I can get at it is relatively, and my figures show the total cost for labor fuel, oil and coal for burning brick this year has been 53 1-3 cents as compared last year with 92 cents using wood and coal.

Mr. McCain—Are the bricks burned just as well with oil?

Mr. Purington—If the cost of fuel was the same; if it cost me just as much for oil and wood to make steam, as it did for wood and coal, I would still burn with oil. My arch brick, aside from the first 18 inches, are the best I have in the kiln. There is'nt a check end brick or discolored brick, or anything that would damage them; they are really the best in the kiln.

A Member—Is there anything in the use of oil as fuel that militates against water-smoking?

Mr. Purington—Yes, sir; so far there has been. To use a burner with an apperture sufficiently small to make a light fire results in clogging that apperture with carbon. The hydro-carbon burner in New York that Mr. Smith represented last year is in many respects, I think, the most complete oil burner I have ever seen. There were five appertures about the size of a knitting needle in that.

A Member—Do you find any difficulty in handling your fires with oil and getting your centers, outside corners and ends, and throwing your heat in any part of the kiln you desire?

Mr. Purington—No, sir; except that we have adopted this in our furnace kilns—our Wingard kilns. The first three kilns we burnt we had a good deal of difficulty, and now to get the heat we let one side go very light and fire the other heavily, so that the two flames, instead of meeting in the center, face, just as with the old-fashioned way.

Mr. Hale, of West Virginia—Do you bring the temperature to a higher degree?

Mr. Purington—I have illustrated that to a great many gentlemen who have come to see me, by showing what I can do, and I can set those bricks to running like water in a July sun. I can get any heat I want inside of two minutes.

Mr. McCain—You use slack coal in Chicago?

Mr. Purington—On the outside courses.

A Member—After you start the fire, and the brick begin to sweat, which all bricks will do, will there be any difficulty in getting the fire up through them?

Mr. Purington—None at all; and there is one advantage in the use of oil over the use of coal: In forcing your fire it is an absolute impossibility to choke your kiln with oil and you've got no ashes; no dust.

A Member—Isn't there smoke from oil?

Mr. Purington—Only in the beginning.

Mr. Cubbins—Do you meet with any difficulty in drying off common brick with oil?

Mr. Purington—We dry our brick artificially.

A Member—What is the average cost per arch to arrange a kiln to burn with oil, taking into consideration the pipe, the burners, tank, and all the appurtenances—to arrange the plant.

Mr. Purington—I can't give you that in detail. I did give my brother the figures and he had it all arranged in detail. I can tell you the gross amount very nearly: to fit up a yard where I am making 35,000,000 of brick it costs

$2,500. That included the steam pipes, tanks and everything complete. I have an oil pipe running the length of the shed for a supply pipe, and have a valve to take the oil as we want it.

A Member—In case all the brickmakers and clay workers of the United States use oil as a fuel, would not the Standard Oil Co. and others take advantage of us and put the price of oil so high we couldn't use it?

Mr. Purington—Well; it's pretty hard for them to have a chance. I investigated this before I went into the oil business. I found there was sufficient oil now above ground to last the United States for five years, taking the consumption of 1887 as a basis.

Mr. Crafts—Mr. Osbourne told me the supply was inexhaustible, and if even they should put up the price of oil, you can go back to coal very readily.

Mr. Purington—The oil we are using is Lima oil—crude oil, and up to this time the Standard Oil Co. have never been able to discover any process whereby they could refine that Lima oil, and it is a question with the Standard Oil Co. what they shall do with the oil.

Prof. Elsom—You spoke of clogging up with those nozzles. Did you ever try super-heating the oil to avoid that?

Mr. Purington—It's a little dangerous. I want to remind all you gentlemen that heating oil is dangerous.

Prof. Elsom—Well; I'm using it in my blowpipe, and had that same difficulty about clogging up, with a low fire, and there is no more danger in super-heating the oil properly than there is in running it direct without super-heating it.

Mr. Purington—The reason I said I thought there was danger is from the fact that so little heat applied to oil will cause evaporation and the formation of gas. At Pullman they had oil run into a barrel and drew it from that to the kiln and in that barrel they had a steam pipe; the burner went along sometime during the night to see how low the oil was in the barrel and they have never yet discovered his lantern.

Mr. Ittner, Omaha—I would like to ask Mr. Purington how far he carries his steam and what temperature it ought to be.

Mr. Purington—The boilers from which I make steam are near the center of the shed and they are 300 feet long; my boilers are 116 feet from the shed back to the engine; that makes to the extreme end of the shed over 600 feet.

Mr. Cubbins—What is the pressure?

Mr. Purington—Eighty to eighty-five pounds; and our judgment is, after the experience of this summer, that 100 would be better.

Mr. Cubbins—I'd like to ask you one question in regard to your insurance: In using oil, do you interfere with your insurance? Are you charged any more?

Mr. Purington—No sir.

Mr. Cubbins—Do you consider it more hazardous to use it?

Mr. Purington—I do not; I've been burnt out twice this summer, for the first time in sixteen years; but neither fire was due to crude oil; one caught from a man filling a lantern from the barrel in the engine room and the other caught from a wood kiln.

Mr. Ittner, of Omaha—Why wouldn't it be a good idea to place coils of pipe under your kiln and let your steam pass through that?

Mr. Crafts—I have done that.

Mr. Purington—I have done the same thing and expect to continue doing it, in cold weather; but really in the summer we fail to discover any benefit from heating the steam. This summer some man who pretended to have a good deal of knowledge of chemistry, told me you couldn't convert water into gas with less than 2,000 degrees of heat.

Prof. Elsom—He does just as I do when I lie. [Laughter]

Mr. Purington—Will you tell me the amount of heat required?

Prof. Elsom—I don't remember, but its less than that.

Mr. Purington—It had occurred to me that if his statement was anywhere near correct, we got no benefit from our steam. It had been one of the theories of men advocating and advertising oil burners, that the steam mixed with the oil and air gave us a great deal better result. My idea is that the only object that steam accomplishes for us is in spraying the oil, and it seems to me that if that is true, we could with compressed air, spray the oil very much cheaper than by using the steam, especially if the steam goes through our kiln and passes off as a vapor. We don't know whether this steam that goes off from our kiln comes through the burner or from the brick. If we are using steam that doesn't help us in burning the brick, it certainly must be a detriment. Do you catch the idea? Is that steam, after spraying the oil, of any further use to us?

Prof. Elsom—It is, certainly– seven-ninths of one per cent. use to you.

Mr. Purington—It certainly isn't a detriment?

Prof. Elsom—No sir; there would be that much advantage in using steam, over compressed air.

Mr. Purington—Suppose the compressed air is heated?

Prof. Elsom—It would be equivalent to steam—both alike.

Mr. Crafts—I had that hot air bee in my bonnet and thought it was a good thing and ascertained that the Norwalk Iron Works made the best air compressor in the country. I went down there and stated my case and they told me they didn't think it would be money in my pocket to buy it; they told me it would take a 40-horse-power boiler to run the compressor giving 40 pounds pressure.

Mr. Ittner, of Omaha—Does anyone here know what amount of heat it takes to burn a brick.

Mr. Eudaly—Well, Mr. Chairman, I've been trying to get the floor on anothe subject. I dislike very much to be taken by surprise. Some combinations of clay will burn at 1200 degrees of heat; it runs on up. 2200 is the average for common clay. Some run as high as 3000. When you get to that, it's all guess work. Fire-brickmakers will talk earnestly about 4,000 and 5,000 degrees and all that sort of thing; but the theoretical heat you can get out of fuel wont run as high as 5,000. The clay can be burnt so it wont go to its original state at 1100, 1200, 1300, 1400 degrees in heat, but to get a good brick, you've got to run it to 2200 degrees. With reference to air and steam for vaporizing the oil. That will be a question discussed considerably in the next two or three years. Most of the oil burners—all that I know anything about, are vaporizing with steam. I know of one burner recently patented, now in use, that vaporizes with the air—cold air. I watched it very closely indeed, and I am inclined to believe that vaporizing with the air will prove to be the best way, and I'll give you my reasons. You want to vaporize steam. What for? In order that the air may mix with it in the burner. I'm saying nothing about hydrogen gas in the water, which is less than one per cent. in the steam; you want to vaporize the oil so that the oxygen of the air will burn it.

Mr. Purington—Which will mix the most readily—oil and steam or oil and air?

Mr. Eudaly—That's just what I was trying to get at. Let me start again. If you vaporize the oil with the steam, you have yet to mix the air before you get the burner; that's what I mean; if you vaporize the oil with the air, you have the mixture already made; that's just the difference exactly. You've got to do it; therefore I hold that vaporizing the oil with the air is the best. Then comes in the question, how much will you add to your fuel by adding the gas of the hydrogen to the steam, and that has been said to be not equal to one per cent. Then the question is, the friction of the steam and the appliance to make the steam—the coal to make the steam and the appliances—will that not more than overbalance that much, less than one per cent? I believe that it will. Now another question. This oil burner that I have examined, and I have been watching it very closely; seen it in many of its tests ever since the inventor commenced it. They haven't succeeded yet in preventing that burner from clogging up with air. I didn't expect that. I felt that by using air, it wouldn't clog. They have been using cold air. The air clogs in the burners and they have to clean them out. It has been suggested that hot air will not clog. I can't see why. A great many people think if you have air highly heated, it will prove a great benefit in burning fuel. That is a great mistake. You can heat air up to a certain temperature, and it is very beneficial. If you heat it very much, it takes more space; you've got to put more into the fuel; put it in faster to supply your fuel with oxygen, and the friction and time, etc., much overbalances the heat you get in the air. Furthermore, if you attempt to heat your air beyond what you can heat it with your appliance, you have to have a furnace for heating air; so when you speak of heating air beyond what you can heat it with the latent heat from the furnace is a mistake. I believe in heating it from the furnace all you can, but to get up some separate appliance is certainly a mistake.

Mr. Cubbins—I would like to ask Mr. Purington,—Do you have any difficulty with the clogging up of your burners during the burning of your kilns?

Mr. Purington—Not a particle; but this question of Mr. Eudaly's has called to my mind an experiment I made with a burner not very different from the old Canada burner. Coming in to the chamber was a T and coming into that T was a quarter of an inch pipe with a little funnel on the top to suck in the air, and that obviated the flittering motion of the old Canada burner. It burned steady. I am inclined to think there's a good deal more air in conjunction with oil than a great many of us realize.

Mr. Crafts—I gave the impression that I didn't think oil was the cheapest. There are two bricks burned with oil entirely, at a cost of 63 cents. Here are two bricks burned with coal supplemented with oil at a less cost. I don't think there's any difference in the hardness but you can see that there is a difference in their color.

Prof. Carpenter—I wish to say one word, in regard to the method of oil burning. They think they've got through experimenting at the Detroit Steel Works, in the use of oil, and are now burning about 15 car loads a day in order to free themselves from the Standard Oil Company. They bought their own oil-well and made their own cars. They think it costs them a little money to do this but they are independent of the Standard Oil Company. They have had two accidents there and two friends of mine who went into the oil business both met with similar accidents. I think the accidents could both have been prevented but are liable to happen by introducing oil in any process. The accidents were caused in both cases by allowing their steam to go down. Their flow of oil was free and all right but in this process of oil burning it is necessary to have a very heavy head of steam in order to atomize or spray the oil and the pressure required is considerable and the higher the pressure the better are the results. Now I think this thing is very clear and ought to be put down—that you do not gain anything except, as Prof. Elsom has put it, by the use of steam over air or any other substance except by the heat you introduce with it. If we put heat into the kiln with the steam we gain some thing. Prof. Cooley, at Ann Arbor, this last year, has been making some tests of the different burners to find out how oil compares with coal. He hasn't come out very well, and I am very much discouraged about putting it in the large plant we have. The best evaporation he has got is 12 pounds against a theoretical evaporation of 18. We probably don't get over 6 or 7, where we ought to get 14 or 15. The oil doesn't show up very well on that test, and in our region at 63c a barrel, it hasn't proved a very great saving over coal; that is, for steam purposes. One question was asked in regard to the temperature it takes to burn brick. Personally I don't know anything about this, but Gen. Humphrey, of Adrian, a few years ago, measured carefully the heat it took to burn brick in various parts of his kiln, and I was looking at the specimens the other day. He got a very light, salmon colored brick of the Adrian clay, with a little over 1200 degrees, and at about 1800 he got a pretty sound brick; whereas at 2700, he got a very hard burned brick as dark as that [illustrating] and one that was burned too hard; that is certainly burnt too hard to be of the best strength, and that was about the temperature that he got with that clay.

Mr. Eudaly—I want to make one remark about this high temperature of steam. I just want to call your attention to the fact that Mr. Purington states that using steam for vaporizing the oil, he finds a high pressure produces better results than a low pressure and so also Mr. Carpenter. I believe a low pressure of steam evaporates more water in the boiler than a high pressure. If that be the case, when you carry a moderately low pressure of steam, you are carrying more of the hydrogen in your kiln than with the high pressure of steam.

NOT ON THE PROGRAMME.

Mr. Blaffer—Mr. President and gentlemen—There is a man in our midst who for years has labored very zealously in the behalf of our Association, and while we have all been away, probably not thinking of what was going on, he has been laboring very hard toward the success of this convention, and to him I may say all is due. He was among the first to suggest this idea of bringing the brickmakers together from the North, South, East and West to come once a year and exchange views as to the best methods of manufacturing brick. In recognition of his services, I will present, in behalf of the Association, a little token of our respect and esteem, and in presenting this to Mr. Randall, I hope he will not accept it merely for the intrinsic value but the sentiment that accompanies it. He is a very good man, no doubt; but when far away from home, he needs watching, and in selecting this token, we have tried to pick out the prettiest face for the handsomest man.

[Hands Mr. Randall an elegant gold watch and chain.]

Mr. Randall—Mr. President and gentlemen of the convention: This rather knocks me out. Mr. Blaffer has been talking to me for half an hour about another matter—something about a resolution referring to the ladies present. [Comes to a stop.]

Mr. Eudaly—Perfect quiet while he makes his speech.

Mr. Randall—I can't do it, gentlemen; words can't express my appreciation of this token. [Stops again.]

Mr. Purington—What's the matter with Randall?

Chorus—He's all right.

Mr. Randall—Well, gentlemen of the convention, I never have received anything, I think, in the way of a token, that I shall esteem and keep as I will this; not for its intrinsic value, but for the token of friendship. [Pauses.] Friendship is a jewel beyond all price, and I prize it as such next to my wife and children, I think I shall cherish this above everything else almost that I shall own in this world, and I assure you that no effort of mine shall ever be spared to make the corresponding secretary worthy of your confidence and friendship. Gentlemen, I thank you.

Mr. Blaffer—There are two ladies in our presence, the wives of Mr. Ittner, of St. Louis, and Mr. McCain, of Denver, Colorado, who have honored us with their presence on this occasion, and I hereby move that these two ladies, in appreciation of their visit, be made honorary members of this Association.

Motion carried by a rising vote.

Mr. Crafts—I only wish to say there is only one drawback, and that is, it was sad that they had to come here and keep watch over their respective husbands. Laughter.

Mr. Purington—I know its getting late, but there are one or two resolutions I've handed the secretary, and one letter I'd like to have him bring up if he can withdraw his attention from that watch long enongh to do it.

Mr. Randall—The first paper is the report of the committee on resolutions on the death of Robert Thomas.

IN MEMORIUM.

WHEREAS, Robert Thomas, a member of Association, passed from works to rewards in August last. Therefore:

Resolved, That in him the Association loses one of its oldest and most valued members.

Mr. Thomas came to this country when he was twenty years of age, and by his ability, honesty and unswerving integrity made for himself a name and reputation of which any man could well be proud. Of him it was always said "his word is as good as his bond," and the Association unites with his sorrowing family and friends in mourning the loss of a kind husband and father, an honest, reliable business man and a good citizen.

Resolved, That these resolutions be spread upon the records of the Association, and that the Secretary be instructed to furnish a copy to the family of our deceased brother.

Committee.
D. V. PURINGTON, Chicago,
J. C. ADAMS, Indianapolis,
W. A. EUDALY, Cincinnati,
A. S. BLAFEER, New Orleans,
C. W. EDMUNDS, Memphis,

Mr. Adams—In seconding the adoption of the resolutions, I desire to say, I was a neighbor of Mr. Thomas; knew him long and well; although of foreign birth, he was a man of intense American thought and convictions; as a competitor in business, he was honorable, upright and manly. He was tenderhearted as a woman and as simpleminded as a child; a man that I respected and honored in all the relations of life. I second the adoption of the report.

Motion carried by a rising vote.

Mr. Purington offered the following resolution:

Resolved, That the President and Recording Secretary be, and they are hereby appointed an Auditing Committee to audit and draw warrants on the Treasurer for the expenses of this Convention; and, further, that the Treasurer is hereby instructed to pay all bills audited by this committee and certified to as correct by the President of the Association.

Motion seconded and carried.

Secretary Randall—The next is also a resolution:

WHEREAS, The National Association of Builders have, through their Secretary, forwarded to each member of this Association a copy of the proceedings of their last annual convention. Therefore,

Resolved, That the thanks of this Association be tendered to them for their kindness and courtesy.

Adopted.

Mr. Purington next read the following:

Resolved, That the proceedings of this Convention be published in pamphlet form and that the Corresponding Secretary be authorized to have 500 copies thereof printed at the expense of the Association.

Mr. Purington—I move the adoption of the resolution. It was the action of the Builders' Convention, the report of their proceedings published in pamphlet form, that awoke me to the necessity of publishing our proceedings; and I want to say further,—Mr. Randall, through the Clay-Worker, has heretofore published a very complete report of our conventions; but if we go on with our conventions and increase the number of papers, we'll have to get some other paper because Indianapolis wont, be big enough to publish a paper of that kind; and I happen to know that the expense of making that publication has been pretty large, and I have introduced this resolution with a view that this year the expense of the stenographer shall be paid by the Association; I think it no more than right that this Association should pay the bills it contracts. [Members—Right! Right! Right you are!] And its left now with the Recording Secretary and the President to audit those bills.

This resolution was discussed at some length, several members speaking on the subject. Mr. Miller, of Chicago, suggested the propriety of publishing advertisements in the report and in that way cover the cost of publication but the idea did not meet the approval of a majority of the members and the resolution was finally seconded and carried by a unanimous vote.

On motion the Convention then adjourned to 2:30 P. M.

FIFTH SESSION.

THURSDAY, NOV. 15, 2:30 P.M.

Convention called to order by President Speed.

Secretary Randall—The first paper in order on the programme for the afternoon session is "A Modern Brickyard," by Chas. E. Eckert, Walkersville, Ont. As Mr. Eckert is among the missing we must take the next paper on the programme, an essay—"Pavers," by J. J. W. Billingsley, Indianapolis, which I have. He is known to nearly all our old members as the senior editor of the "Clay Worker," and I am very sorry he is unable to attend here in person.

Mr. Randall read the paper.

"PAVERS."—BY J. J. W. BILLINGSLEY.

The improvement of streets and highways in this country is receiving a very considerable degree of attention; more especially in the older settled sections of the country. "The best pavement for the money" has racked the brains of the city authorities of more than one city. The pavement that will be most durable may not be desirable on account of the very rough character of the traveled surface, the wear and tear of the vehicles, and the liability of the draft and carriage horses to get lame or become stiffened where there is a want of elasticity, makes such pavements objectionable.

There are bowldered and stone pavements that those traveling the streets will avoid by driving two or three squares out of their way to their business. Streets improved with wooden blocks are good enough for three or four years without repair, after which they may be used a few years with needed repairs; then the rotten wooden blocks have to be removed altogether. Wooden paved streets are expensive, short-lived and on the whole unsatisfactory.

Asphaltum makes a smooth, elastic, springy street, but a few years will wear the surface into holes or depressions, and these are very difficult to repair, in fact, repairs are seldom satisfactory, besides, they are expensive.

Latterly, in this country, the use of brick for paving streets has been receiving some attention.

Sixteen years ago, at Charlestown, W. Va., they put down a few squares of brick pavement which have been subjected to heavy travel, and we are informed that they have stood the wear well. Since they have tested them they are generally improving their streets by paving them with brick.

At Steubenville, O., they have had a test of eight years on the principal street of that city. The pavement so far has exceeded the most sanguine expectations. The writer visited Steubenville in May last and examined the street that was first paved and was agreeably surprised to see that it looked as if though it had been laid only a year or two. The wear of eight years was hardly perceptible.

Fourteen years ago Mr. Heafer, of Bloomington, Ill., laid one square of brick pavement on the west side of the Court House. The writer has frequently visited that city since that time and has examined the pavement, finding it all that could be desired. Since they have been convinced of its merit the city authorities have improved several of their principal streets in this way.

We are informed that Galesburg, Lincoln, Peoria, Springfield, and other cities in Illinois, have put down many miles of brick pavement.

Decatur, Ill., has several miles of streets paved with brick, to the writer's own knowledge. In fact, all of their principal streets have been thus improved. This city commenced the use of brick eight years ago. At one time they had five miles of their streets and sidewalks under contract for brick pavement.

In Ohio brick are being generally introduced in the smaller towns and cities—at Columbus, Cleveland, Akron, and other places.

We have heard of no dissatisfaction where hard burned brick have been used. We heard of one square in part that was paved with soft brick, in Columbus, Ohio, by some interested stone contractors, that was taken up and replaced with West Virginia hard burned to keep up the reputation of the pavement. Within the past year a section of one of the principal streets in Washington, D. C., has been paved with West Virginia paving brick.

The introduction of brick for street paving in our large cities would meet with general favor if it was not for some of the all-wise engineers. Mention brick to one of them if you want to see a frown mantle his face. "No sir! No sir!" he says, and then takes a hammer and a common burnt brick and hits the brick, and, knocking off a piece, says: "There now, don't you see it won't do?" He forgets that a square block of stone with sharp edges and corners, subjected to the same test, would likely be as easily defaced.

BRICK PAVEMENTS ARE NO NEW THING.

It is no innovation of the past decade of years. It is no new fangled invention gotten up by hard pressed brick makers to tide over a dull period in their business. It is not a new thing in this country, and it's less so in the Old World.

Prof. Roberts, of Cornell University, N. Y., a year ago, in a conversation with the writer, said: "I wonder that our people do not use more brick in the improvement of our streets and highways. In the Netherlands the highways are generally paved with brick. In a ride of several days through the country visiting various herds of Jersey cattle I did not drive over more than six or eight miles of dirt road. Some of the highways have been paved for more than a half a century, and they require little repair and make splendid roads to travel over."

THE KIND OF BRICK REQUIRED.

The brick should be hard and not easily chipped or crushed. There is no denying the fact that some clays are better adapted to the manufacture of pavers than other clays. But it is also true that in many localities clays may be found that are well adapted to this use. A clay that will burn to a hard body, having a tough fibre, (if the term "fibre" is admissable in distinguishing the adhesiveness or toughness of the product).

There are large brick plants in Eastern Ohio and West Virginia that make a specialty of the manufacture of paving brick. We are further informed that they make a specialty of the manufacture of pavers at Galesburg, Ill. The Decatur Tile & Brick Works, of Decatur, Ill., manufacture them in large quantities. But it is also true that in the burning of common brick a great many pavers might be selected from the kilns. We feel free to say that clays well adapted to the manufacture of this desirable product are so abundant that no one manufacturer is likely to have a monopoly of the business in any very large section of the country.

BRICK PAVEMENTS ARE DESIRABLE FOR THE FOLLOWING REASONS:

1st. They make a smooth pavement over which heavy loads may be drawn without a jolt. Draft horses are able to draw a third larger load over such a pavement than over a bowlder or rough stone pavement. In addition both team and wagon are subjected to less wear. For light vehicles there is a most striking comparison. It is a pleasure to sweep along without a jolt or a jar over the smooth, springy brick pavement, and a tribulation to drive over the cobble or rough stones.

2nd. Brick pavements are desirable because they are durable. The many instances already referred to are sufficient without adding another.

3rd. The abundance of the material that is at hand—every street, sidewalk and highway may be paved with brick and an abundance of material would be left in store.

4th. Brick pavements are easily repaired. There is not a pavement that can be named that can be so easily repaired as brick. If a single brick is too soft, replace it with another, and the work is done.

5th. Brick pavements are less expensive than others, if durability, wear and tear of teams, vehicles and comfort are taken into account. The cost of construction ranges from $1.00 to $1.40 per square yard.

CONSTRUCTION.

First of all, the roadbed should be crowned a little and well underdrained; no springy or spouty places should be allowed to interfere with the solidity of the foundation. This may be done with a tile drain at the foot of the crown, on each side of the roadway or street. To a solid roadbed add three or four inches of sand, then a layer of brick laid flat, two inches more of sand, followed with a layer of brick set on edge and the interstices filled with sand, and a small covering of sand on top. The latter will soon wear off. Another method is to set one layer of brick on the four inches of sand and settle with mauls and cover with sand as before. This is the cheaper method and it is good enough. Where sand cannot be had in sufficient quantity the bed for the brick is made smooth and even and soft, or pulverized for one or two inches on the surface, the brick set on edge and settled a little, and the joints or interstices filled with the fine earth.

Again, others use plank, laid upon a roadbed brought to the desired grade, placing the plank upon sand or upon a clay bed, setting the brick on edge in a light layer of sand, then filling the interstices as before.

HOW TO GET PAVERS INTO GENERAL USE.

Lastly, how shall we get everybody to favor the use of pavers in the improvement of our streets? is the question. Every brick manufacturer can see that if pavers come into general use for improving the streets of our larger towns and cities, the demand would be immense. There would be lively times about the brick yards. One suggestion in this line and the writer will wait the further pleasure of this convention. It is this: Let every enterprising brick manufacturer get the city council of his town or city to allow him to put down the length of one square of brick pavement with the condition in the contract that if it proves satisfactory in one year's use, then the town or city is to pay the cost of its construction. Select hard burned brick and lay them perfectly, and, the writer's word for it, pavers will be well and favorably introduced into general use.

The convention will take notice that we have suggested that "enterprising" brick manufacturers undertake the work of laying the introductory pavement. We do this for the reason that those who are slovenly and easy going in their habits would botch the job and be a hindrance in the progress of the work The importance of the matter demands the best efforts of the best men of the craft. With true Roman courage find a way or make it.

The Chairman — Gentlemen, you have heard the paper of Mr. Billingsley read. If there are any members present who desire to take up the question it is now open for

DISCUSSION.

Mr. Crafts—I was going to say that in our vicinity we have such quantities of stone admirably adapted for macadamizing that I suppose it would be difficult work to introduce that material, and that on the score of economy it wouldn't be advisable, though I am perfectly satisfied that we might use swell brick, called lammy brick, those brick we use now to line the outside of sewers with, for where a man wants to put a driveway into the street across a crowded sidewalk they put those brick on edge for the passage of their heaviest teams. I never heard any complaint about their wearing out, but the question struck me whether a brick pavement was more liable to have sunk holes in it like stone, and whether it could be mended the same way.

Mr. Randall—There is a gentleman present who I think is pretty well informed on this question, and while he is interested in a certain method of paving, still I think he might speak on the subject. I refer to Mr. Hale, of Charleston, W. Va.

Mr. Hale—In 1870, in brickmaking, among other things, starting with a Girard machine, I made a very hard, durable brick. We had a fine clay to begin with, and finding they were so hard, I proposed to the city to put down a block of paving with the brick. It was considered an absurdity by everybody—worse than useless, but they said if you choose to spend your money on it, you can do so. I did just what Mr. Billingsley recommended—put it down at my own expense. It stayed there three years, and during that time the city was so thoroughly convinced of its value that they authorized me to put it down at their expense, which I did, and they were so much more pleased with it that they dug up this first piece of pavement in order to regrade the street, and paved that whole street with it, and every year since then they have added to their brick pavement. They now have miles of it, and, as an evidence of how it is esteemed there, a gentleman in Ohio wrote to one of our citizens there, a very large property holder, whose premises were paved with this pavement, and asked him what he thought of it. His reply was this: "On political questions, tariff questions, religious questions, and so on, we are at variance, but upon the question of brick pavement there's but one opinion held; that is unanimous that brick is the best and cheapest pavement in the world." I have a pamphlet with me here giving the certificate of United States and railroad engineers and city engineers and business people there in regard to this pavement. In paving there are three or four different methods known to me. I first laid it with boards. I was the first one to use boards to serve as a foundation for the pavement. Our method is this: grade the street up to the proper convexity, take about three or four inches of sand, smooth that with a template drawn over it, then put down oak boards. We use that because it is very abundant and cheap—our cheapest timber—laid down longitudinally of the streets. The reason for that is our city is only a small place and it isn't finished yet; and, like all new places, they are digging it up every year for water and gas mains and other purposes, and boards are laid longitudinally so you can dig up the middle or side of the street, and just take up the boards and lay them aside and put them back, and you wouldn't know they had been taken up. A number of our streets have been cut up several times. One street, the first that the city paid for, was laid in 1873. That pavement has been in constant use, and the streets above and below, for a long time were merely mud streets, and the teams would go several squares to go over that street, so that it had more than the usual amount of service, and in 15 years, with the exception of repairing it where it has been taken up and put down imperfectly by gas companies, etc., there hasn't been $15 of repairs on it; it certainly will last 15 years more. Our brick are very hard—harder than usual. I also brought some pieces of the oak board. To-day that board is as sound as when it was put down, 15 years ago. Certainly the brick and boards are durable to that extent. A number of other cities have already adopted it, some on an extensive scale, some on a small scale. We have contracts now for next spring to put down our pavements in other places. Another method of paving alluded to in this paper is one which was introduced lately in Bloomington, Ills. Mr. Sefer and Major Gregory put down a piece there which was a double course of brick—one laid longitudinally and the other across the street at right angles, filled in with tar and sand. It made an excellent pavement, and I have seen in several cities where it would wear as well, stand up as well. But my impression is that the board is better than two courses of brick. They approach nearer to the cobble-stone pavement. In cobble-stone pavement each stone stands on its own bottom, and the result is they are frequently being repaired, but with brick placed upon a board like that, you can't punch it through that board or sink the whole board.

Chairman Ittner—Do you have anything between the boards and the brick?

Mr. Hale—Yes, sir; an inch and a half of sand—about the best quality of sand. The object is chiefly, that brick burnt for paving brick are more or less rough. It is not necessary or desirable that they should be smooth. Any little inequality in the brick is imbedded in the sand, and the smooth surface comes on top, and the top of the pavement is just as smooth as this floor, producing pavement smoother, cheaper and more durable than asphalt.

Mr. Crafts—Isn't it better to lay the boards longitudinally in every case?

Mr. Hale—No, sir; I don't know that it would be in every case.

A Member—You lay your bricks crosswise, don't you?

Mr. Hale—No, sir; generally in herribon style, across each other.

Mr. Crafts—Is that good for horses' feet?

Mr. Hale—I don't know that there is any difference. I never knew a horse to slip on that pavement in my life, and I've asked people if they ever heard of a horse slipping or falling and they said never.

The Chairman—What is the cost of this paving?

Mr. Hale—Cheaper than any other pavement, sir; the materials are so cheap that they can be put down cheaper than any other system. It is undoubtedly cheaper than a macadamized road, because you can't keep macadam smooth and level, and every year you've got to be filling up the holes. At one time you have it in holes and at another time the fresh broken stone; but a brick pavement is smooth all the while, and in Charleston it has lasted 15 years, and I think will last 15 longer. With us the cost has been $1.15, $1.25 and $1.40 per square yard, the brick being figured at from $6 to $10 a thousand. They were then smaller than the usual size, now they are making them 8x4x2⅜.

Mr. Crafts—There's no place then but what the material would be just as cheap?

Mr. Hale—I suppose so. Our clay is very suitable for this purpose, and some machines make a very much better paving brick than others. A gentleman in my neighborhood has a very expensive brick plant for a small town; he had one of the Auburn Machines, with which he made a very excellent brick for paving streets. Last year he threw it out and put in a very expensive machine costing $2,000; he thought he was going to get a very superior brick; filled two kilns and burnt them, and he didn't get a single paving brick out of the whole lot and sued the man that sold him the machine, for ten thousand dollars. A great many people say, 'Why not have a different shaped block?' and there have been several patents for different blocks, but I think when you depart from the common brick you make a mistake. When you use a common size brick there is not a brick lost, but with special sizes there is great uncertainty about getting the brick properly burnt, but in ordinary kilns, and ordinary size, whatever isn't good for paving brick, is good for building, and there's no waste, so I think a brick pavement is the cheapest. Brick is universally distributed; clay is found all over the world, and while some clays are better than others, good clay can be found in almost any section. One gentleman tells me the clay in Chicago has a great deal of lime in it. That would be very objectionable for a paving brick; but certainly not far from Chicago and cheaply accessible to Chicago, there is abundant clay which would make admirable paving brick; no doubt about that. I inquired at Bloomington of the distance and price there; I suppose bricks could be shipped from Bloomington to Chicago, 120 miles, for a dollar or a dollar and a half. I know we are shipping to Kanawah, 250 miles, for $2.00; not because they haven't the material there, but because they are not prepared for making them there. There is another method or two of laying the pavement, by putting a foundation of broken stone six or eight inches deep; that is much more expensive pavement than the board, and if there's a wet place in the pavement, it gets a little soft and will go down in the pavement. A great many people ask, "Won't heavy loads break up your pavement?" I answer "No." Charleston is the capital of our State and some heavy stones are used in the construction of buildings there—14 feet long; 3½x2 feet; and I will say here that there are no broad tires on the wagons—all narrow tires; and stones of that sort are hauled for a mile over brick paved streets; some of the stones weighed eight or nine tons; eleven men got on top of one; it was so large a stone that people came all along the street to see what effect it would have on the pavement, and not a brick was broken so far as I know. So with large iron safes, weighing eight or ten tons. Therefore I think that pavement will stand any amount of pressure that may be put on it. No pressure put on that brick [illustrating] with a smooth floor under it, could break that brick by pressure.

A Member—Is this process of laying pavements with the boards patented?

Mr. Hale—Yes sir. The company doesn't lay any pavement, but they license other people to lay it themselves.

A Member—Are they in use anywhere besides Charleston and Columbus?

Mr. Hale—In Wheeling, Parkersburg, Point Pleasant, Greensboro, N.C., and there are several other cities now that are preparing to lay it next Spring as soon as the season opens. At Columbus, O., they didn't have the brick and are shipping there from Charlestown, Parkersburg and Middlebrook, Ohio.

Prof. Carpenter—I wish to say just a word on this paving question. About 17 years ago Mr. Gresham, of Detroit, at his own expense, constructed in the city of Detroit at the intersection of two streets, a brick pavement in the hopes of introducing the paving in that city. That was in good order for eight or ten years after it was put down and withstood a very heavy traffic of teams going both ways. The construction was very simple, consisting of hard burnt handmade brick soaked in hot coal tar. Mr. Morrisey claimed this soaking in hot tar made the brick impervious to cold water and increased its strength. That pavement stood very well, but through one of the idiosyncracies of the city council, he never could get it introduced.

Mr. Ellis, of Atchison, Kan.—I'm in the paving brick business in Atchison, making this brick; it is what we use now. I've investigated this carefully in different cities using brick. We put two courses of brick, first grading our street a perfect grade, lay four inches of sand, gauge it and lay brick lengthwise, then put on two inches of sand and gauge it and lay the brick crossways. We have a street there that's been down a year; there's no settling in that street anywhere; I've been over it recently. I never heard of a hard burned brick being effected by frost. What we aim at in a paving brick is to get a brick with hardness and strength; we do that by having a great deal of silica and oxide of iron. One of those brick there was burnt a little too much. We have to burn them like that brick; keep the toughness of the clay in with the hardness. They burn to the glaze and melt. I've corresponded with a good many engineers. Cleveland, O., invested $140,000 in one brick contract; Bloomington and Peoria are using it; St. Joe is agitating it and Kansas City is putting in a block on trial, and most all those Western cities have other companies paving with brick or intend to in the spring. I'll guarantee that if you put that brick in boiling water it will not change the looks or the scale. I'll further say there's no patent on our process or the brick either.

Mr. Smith, of Newburyport, Mass.—I wish first to ask the gentleman if he had brick transported 200 miles for $2 a thousand?

Mr. Hale—Yes sir.

Mr. Smith—I wish to say that in Nashville they lay brick one single course on merely planking the ground, put on hot coal tar, fill up the crevices, put a little sand over it, and that's all they want. They may put something in the tar, such as the gravel in a roof, and its right solid together; its been down eight or ten years you can't see that anything has ever been on it.

Mr. Miller, of Chicago—I've watched with interest the different kinds of pavements put down in Chicago. We have a wooden pavement which is very satisfactory, but on account of its softness it wears out. They are putting down granite now. The difficulty with that is it's slippery; it very soon polishes. You can't polish brick. On brick sidewalks our shoes wear out sooner than on other pavements. That proves that a brick pavement presents more friction between the horses' shoe and itself than anything which is or may be polished; so I claim that that is the reason a brick pavement is going to come into use; because, in the first place, on account of its smoothness, its good for the wheels, and it is good for the horses' feet because it gives the friction beneath the horses' hoof; the material itself is smooth enough to allow the horse to pull and it still presents that sand paper like surface.

Mr. Crafts—I have no doubt the gentleman is quite right, but he comes here and stands us on our heads at once. It's never been supposed to be a conceivable thing that brick was suitable for a pavement, but I think as far as the argument's concerned, he's got the bulge on it; and what the gentleman has just said as to brick not polishing, is one of the strongest arguments in favor of it. Whoever has traveled in New York, has seen the horses come down, and there's no remedy unless you sand paper the street pavement, and that wont last; but it is true that there's no such thing as a slippery brick. I don't see the advantage of filling the pavement up with coal tar.

Mr. Miller—It's to keep the water out of the spaces between the brick.

A Member—What is the objection to filling them with sand?

Mr. Miller—The water would go through and run down to the boards.

Mr. Hale—In Charleston we use no tar whatever; we have very fine sand, and that sand is packed down and makes an impervious joint, perfectly water-tight; the engineers couldn't be convinced that sand was impervious to water—thought water would go through sand. In Charleston we have very fine, sharp sand, and we have no difficulty at all in making those joints perfectly water-tight; then every wheel and hoof and foot that goes over it is caulking that sand down tighter and tighter and tighter until its perfectly impervious to water. An engineer from some other city was there a short time ago and couldn't be convinced that was the case and after testing it in different parts of the street and finding that the sand was clean and dry below the surface, he went to a puddle in the street where the water had been standing, at the intersection of two streets and dammed it back with mud and dug down through the pavement and cut through the boards and the sand was clean and white as the day it was put there.

Mr. Purington—How about the noise?

Mr. Hale—It's less noisy than any except asphalt and I don't think it is as noisy as asphalt; it is the most noiseless pavement, unless it be wood.

Mr. Eudaly—I feel just like saying a word on this paving business, as I've been making it a study for a number of years—little bit interested directly in that line. There are a great many questions to be considered. One of the most perplexing ones is how to convince town councils that paving brick are at all suitable for streets Two or three years ago it was next to an impossibility; the idea of putting brick down to drive over seemed to be perfectly absurd, and you will find now in a great many cities they are still of that opinion, while in a great many other cities they are putting in brick pavements. Just a word as to the foundation. I have heard the theory advanced by scientific engineers that the foundation for a brick pavement should not be solid as a foundation would be for granite; that the foundation should have some spring. They give two reasons for this argument; one is, it would be easier on a horse's hoof, as is the cedar block, having some spring; and another is, that when the foundation has some spring, that the blow of the wheel or hoof on the brick, will not break it so easily and that it is much better than either. One thing, however, that the engineers insisted upon is that the water must be kept from under the brick so that they will not freeze and bulge up. I missed the first day's convention, but the next morning I read the proceedings in the papers, and one of the things made prominent in some of the papers was that the brickmakers were gentlemen. They seemed to be very much surprised in Memphis that they were well dressed men; they expected to find rough, clumsy sort of fellows that didn't know very much and never ought to. I wear the same old clothes I wore four years ago; I didn't get a new suit this election like some of you fellows. The trouble about the whole business is that people not actually making brick are not up to the brick business; they don't appreciate a brick; they have not been brought to understand what a brick is. I sometimes get wonderfully provoked to see the absurd ideas architects will advance with reference to the crushing strength of brick. Did you know that if you build a wall two feet thick with excellent mortar with ordinary brick, it will stand its weight 200 feet high; I suppose double that.

Mr. Crafts—There's a chimney at Ansonia, Conn., built with brick, that is over 200 feet high.

Mr. Hale—There is one in Cincinnati over 300.

Mr. Eudaly—The main point I wanted to urge in this connection was simply this; that city councilmen and people who are not accustomed to handling brick, have a way of looking down upon the brick men and the brick business. The time will come when bricks for pavement will be in much greater favor in this country than granite. There isn't any question about it, for the very reason advanced this evening. You take the large territory of our country and it has clay all over it. You can scarcely go anywhere you can't find brick clay to make a fair paving brick of. I can find clay to make paving brick all around this town, and if the people of Memphis would wake up and make a paving brick, we wouldn't have so much mud to walk through. I expect that's the first bad word that's been said about Memphis in this convention, and I said that because we are about to go away. A brick mustn't be burnt absolutely to death to make a paving brick out of it. I not long ago saw a city council condemn some brick because they weren't burned as black as a hat. If you made them out of white clay, they'd want them burned as black as a hat. A brick burned too hard is not so good for paving or anything else, as a brick moderately burnt; it chips off and will break.

Mr. Crafts—I had a dispute with the city engineers at New Haven with regard to a brick being hard enough for a sewer; I broke out $\frac{7}{8}$ and it stood 1100 pounds without a crack in it.

Mr. Ellis—I wish to differ with the gentlemen on the polishing of brick. There's a brick [showing a brick] that will polish equal to marble. I was at Galesburg last summer and took up a brick out of the street that had been there four years. The surface of that brick is as fine a polish as marble. And another thing I wish to say—I've got no interest here, only I've had a hard fight with our city council on the paving matter and have won. We had asphalt out there and cedar blocks to fight. I made it a point to circulate my own petition. I had this advantage—I claimed a home manufacture; not a dollar would go out of the town except for coal; I had something to give employment to labor in the town. With this argument the community in general, with three-quarters to nine-tenths of the property owners on the street were with me and the city council couldn't go back on that. There's a brick that would break a granite block of the same size in two. That brick is a reburnt brick—a salmon brick put back in the kiln and burnt; that's our best quality of brick—something that the iron is alive in.

Mr. Purington—I apprehend that if we investigate this question carefully, we'll find there's as much difference in clay for making a paving brick as in the burning of the different clays. I'm satisfied we have no clay in the immediate vicinity of Chicago that can be successfully made into a paving brick. I've seen the Galesburg clay, and it don't make any difference what sort of machine you make them on, if you burn them right. They make brick on a little sausage machine. Our Chicago clay would be worthless if made on the same machine; but their clay has a peculiar faculty or quality that enables it to become vitrified without melting. If we get our clay in Chicago to a vitrifying heat we are almost sure to melt it, because the two points are so close together that I believe it will always be found an impossibility to draw the line; so while I believe in bricks as a pavement, I think there are certain localities that will have to import their brick for the purpose.

The Chairman—It is now suggested that we leave this paving brick question, which is a very important question, but the time is growing short, and we will now have to proceed to other matters.

Mr. Smith, of Newburyport, Mass., in response to calls, then addressed the convention on

BRICKMAKIDG IN NEW ENGLAND.

Mr. Smith—Gentlemen, I took the

trouble to come pretty near 1,500 miles to attend this convention, because it seemed to me to be an important step in the propulsion of civilization—the manufacture of permanent articles of building materials superior to any other articles now known to the civilized world. I always felt as though it was important for a man to do something which would be lasting and substantial. We all know that burnt clay is the last thing to be lost in civilized society and it is the last thing to be destroyed. Now, gentlemen, I have been in the business some time, and after making brick by hand for 25 years, I adopted the machine brick business and have been running the machine from that time till now. Brickmaking by hand is generally abandoned by most of the manufacturers. But no machine will apply to all places. I am satisfied that in manufacturing brick in our section of the country, the machine we now use is superior to most any other we might adopt. I have had a great many circulars, and have visited many large machine shops and brickyards, from Bangor to New Orleans, and from Boston to St. Louis, and I see but very little advantage in them over a machine that can take the clay from the bank, and form it into a brick suitable for the work with the simple process of running through one machine. I don' know how you can do it cheaper than that. This machine that I run; we put the machinery into a dry house and the men are not exposed to the weather or the sun in hot days. The only men that work out-doors are the men that have to get down in the clay and bring that in. I find it a nicer and cleaner business—much more comfortable than any kind of a mud machine that can be made. To illustrate the matter, I thought I'd bring a brick, but when I started to do it it looked to be too much of a task, so I took one out into the shop, took a cold chisel and struck it off, so; and you see how square that comes off. We don't make a very large brick for the reason you must make brick according to the size of the men. A man eight feet high and weighing 400 pounds, would make a much larger brick. We can make a brick about as strong, or about as weak as we are a mind to, by putting in more clay or more sand. To show you the strength of some of the brick we can make, when they built the waterworks in Boston, I made brick, and made a contract to deliver 20,000 a day. They sent down a man to examine and look at them, and I made some of them so hard that the man took one of them and with it drove a railroad spike into a cedar post, clear up to the head, and you couldn't see the mark of the spike on that brick. In Boston they don't want a hard brick, they prefer to have them soft, because they will soak the moisture and soak it much quicker, and they have got used to that style and don't like anything solid and hard; and the architects of Boston won't admit machine brick into their buildings. They rejected those brick, but I sent them to New York and had them tested by Mr. Haskell, the greatest engineer in the United States. I suppose you all have heard of him, anyway—and his test shows that these brick will stand 14,000 pounds to the square inch, over twice any hand brick you can find, yet for all that Boston condemns them. It's only by selling them a little less than the usual price that I can get them in, and some particular contractor who has a great influence can put them in. Therefore, I have labored at a great disadvantage for years—have been kept down. The architects of Boston are more ignorant of clay than any other one thing in the whole world. You ask the best chemist in the State of Massachusetts what a brick amounts to and he will tell you the last thing to dissolve in a brick is sand. The only way I can burn my brick is to put sand between them, and it won't melt. I wont discuss that part about the burning of brick at this time, and what is burnt brick. I wish this convention could be held in the eastern part of the State of Massachusetts, that we might present the importance of this matter. I once went to Philadelphia, and never was so astonished in my life as to see how ignorant they were.

[Mr. McCain stands up. A voice—What's the matter with McCain. Great applause and laughter.]

Mr. Smith—In Philadelphia I went down to a yard and there they were wheeling clay, and they had a man striking one brick at a time with his hand, and a little boy laying them off on the ground. If there's anything slower than that, I dont know what it is. They have this old wheel going around; it seemed to me a thousand years behind the age. Right in the vicinity of Boston, they even daub the mud in their hands now, in this civilized time. You've got the power of steam and machines of all kinds where brick can be run off with some speed. I believe that the manufacturing of brick is one of the most important industries of this time. Build a frame structure, and you have to spend half the money for insurance, and the other half keeps the building in repair. I belong in a little bit of a city where nearly all the buildings are wood; even a mason, when he builds a house for himself builds it of wood. There has not been three brick houses built there in 40 years.

Mr. Purington—How large is it?

Mr. Smith—14,000.

Mr. Crafts—How long have they been asleep?

Mr. Smith—It's just waking up. In the western part of Massachusetts the people and the architects will admit that brick can be made by machine, but in the eastern part and in Boston the architects can't be convinced of anything.

A SWIFT MACHINE.

Mr. McCain—Old Philadelphia is my native city, where I was born and raised, and I can't, with good grace, sit still and think that old quaker concern behind the times. I wish to state to this convention that our good brother, Mr. Smith, has not visited some parts of of Philadelphia, for I can tell him that in 1862 the first Chambers machine that was erected was put up on Gillespie's yard in Philadelphia, and is working till this day, and although I am in strong favor of machinery I've yet got to see the city that can turn around and beat Philadelphia for making a day's work of brick on their yard, one single brick at a time, without any bottom in their moulds, or can put better brick on the face of their buildings, except Baltimore, and their brick is made in the same manner. I am proud of this machinery, and of the strong invitation that Brother Smith has given us, that we may go to that land of intellect and intelligence, because we all know that Massachusetts is the father of the United States in the educational line and the intelligence of humanity. I am proud of that invitation, and if the majority of the convention will say so, I'll go there too; if you meet in heaven I'll go after you. Now, gentlemen, when the ward machine is got up—I'll never have a better opportunity than now to tell it to you, and I will let you see that even Boston is behind the age. There is an old gentleman in Denver, Colorado, who has got a machine that I saw with my eyes and timed it with my watch, and another gentleman with his watch, and it made 168 brick in one-half-minute, [Great excitement laughter and applause, continuing through the remainder of the sentence] and it made its own bricks, sanded its own moulds, and there was nothing attached to it but one pair of horses and a man. [Great applause, laughter and cries of oh, oh, oh.]

Mr. McKenna, of Chicago—And did the machine collect the bills, too?

Mr. McCain—That's an impertinent question. [Laughter and applause.] Gentlemen, on the honor of a brickmaker, and that can never be disputed in a brickmakers' convention, I am speaking the truth. Now, to explain that matter a little further, I will state to the gentlemen here—and, by the way, if there's a delegate from Michigan here, that state gets the credit of producing that old gentlemen, for that's where he belongs—this old gentleman sent for Mr. Brewer to come to his house, he had a model of the machine, a working model. It was about the size of that chair if you cut the back off. The bricks that he made, I didn't measure them, but from the best of my judgment from looking at them, were about two inches long, a full inch wide and three-quarters of an inch thick. The clay was tempered the same as if you were going to make it by hand, previously, and the clay was thrown in a hopper at the top and then the machine moved, and it dropped eight bricks on the floor at a time with what is called loose-bottom moulds, so that they dropped about this way [illustrating]. Now, I contend in reference to the machine, that the brick was equally as good a test as you could ask of a machine, because if made the proper size to turn out a proper-sized brick, it will make a larger-sized brick than that little one. Now, gentlemen, I'm not advocating the machine, because the old crank that's got it will never sell it, give it away, hire it, or anything else, but I only wish to tell you what may be done out at the base of the Rocky Mountains.

The Chairman—We will now take up the next in order on the programme.

MISCELLANEOUS BUSINESS.

Secretary Randall—The first matter for consideration under this head is a series of invitations from the Kansas City (Mo.) Board of Trade, and several prominent residents of that city, requesting us to hold our next annual convention there. These invitations are presented through our Brother Campbell and are very cordial and earnest.

Mr. Smith, of Omaha—I don't know what the by-laws of this Association are regarding holding conventions.

Mr. Randall—The by-laws state that the place of meeting shall be determined by the executive committee, and announced not less than three months previous to time of meeting.

On motion of Mr. Smith, of Omaha, a vote of thanks was tendered to the Kansas City gentlemen for the interest manifested, and the resolutions ordered read and spread upon the records of the Association.

After a lengthy discussion the question of the time and place of holding the next annual meeting was referred to the executive committee as provided in the by-laws of the Association.

Mr. Purington—We have in Chicago a prominent Republican politician who attends all the conventions. I never knew one he didn't attend, and introduce from one to ten resolutions, and he has gone for years by the name of Resolution Burke, and I am afraid I shall get the name of Resolution Purington; but I have one more, and I introduce this resolution with a great deal of trepidation. So far our meeting has been very harmonious, and I dislike to introduce a resolution that may produce discord among the members. At the same time I feel it my duty to proceed:

Resolved, That the thanks of this Association be tendered to the reception committee of the local manufacturers, the citizens of Memphis, and the proprietors of the New Gayoso hotel, for the magnificent manner in which this Association has been entertained during its stay in Memphis.

Resolved, That the thanks of this Association be tendered to the Avalanche and the Appeal of this city, for the full and accurate reports of our preceedings they have published.

Resolved, That we shall leave the city of Memphis with our hearts filled with pleasant recollections of the most courteous treatment and generous hospitality ever extended a similar body.

Mr. Randall—Our President is apt to gain a reputation as a humorist if he starts out by speaking as though such a resolution as this is going to stir up turmoil and dissention. I want to add an additional word as to the press of Memphis. I have been surprised and astonished at the fullness of the reports of the Memphis papers of the proceedings of our Association. It is seldom, if ever, a convention of this character is reported so carefully and completely as they have done it here. I think we will all go away from Memphis in a spirit that will bring us back if we ever have the slightest excuse. I move the adoption of the resolutions.

Carried by a rising vote.

The Chairman—Next on the programme is

THE QUESTION BOX.

Secretary Randall—The first question is as follows: "What is the cause of brick being solider in the kiln right above the arches than in the middle of the benches?" This is a question that a gentleman has taken the pains to send here to me in a letter. He said he regretted very much he couldn't come in person.

Mr. Crafts—I should answer it, so far as my experience goes, by saying they are not.

Mr. Hale—I should say that a man didn't have them burnt, that's just the trouble.

Mr. Randall—The second query is: "Can any member give information on the subject of burning brick with coal gas?" I think, perhaps, Mr. President, I can give the gentleman who asked that question the information he desires. I'm going to adopt the method of Mr. Elsom. If the gentleman will address me I can give him the name of a firm that is using coal gas. I think it's the Grapejuice something Company. I dont remember the exact address, but if the gentleman will write to me I'll give him the name of the company. That is all the questions in the box, and, so far as I know, there is no further routine business. I have received since coming to Memphis, several letters from members scattered around generally through the country. They are all of one purport, regretting exceedingly that they couldn't come. Some expected to come up to the last moment. I don't suppose it is necessary to read the letters.

Mr. Crafts—I should like to say, as Mr. Pike said at the opening, if we have any spare time, I should like to hear from the brickmakers—hear their experience in regard to the cost of burning their brick and what they use for burning them. That is really one of the most vital questions to be determined.

Mr. Randall—As a member of the executive committee, I know there's one question that is going to require a good deal of hard thinking, and that is in regard to our next place of meeting, and I wish every member here would stop and think a moment. They've talked about going East and going West. Kansas City is the only place that has extended an invitation; several members have spoken about going to Philadelphia. I'd like to ask those members present who are in favor of going to Philadelphia, to signify their desire by holding up their hands.

Twenty-four held up their hands.

Mr. Randall—All those in favor of going to Kansas City—there's another point to that: it is from the West and the central states that we have received our largest representation. One thing we hope to do by going East is to instill a little life into those Eastern men. They seem to have the idea this is a Western enterprise, and don't feel much interested.

Mr. Ittner, of Omaha—Kansas City has sent an invitation.

Mr. Crafts—I'm in favor of Philadelphia because I imagine there's large numbers of brickmakers who have grave doubts in their heads that there is such an Association as this and think that if there is it isn't any account.

Mr. Purington—They are a good deal like an old brickmaker in Chicago. I tried to get him to attend this convention, and offered to pay his expenses if he would come down here. He said "I can't learn anything myself or teach anybody else."

Mr. Crafts—Last year was the first time we got any member from the East; and this year they came again. When you go East you'll get more members, and when you go West again they'll follow you.

Mr. McCain—In Washington, D. C., next September, the conclave of the Knight Templars of the Masonic Order of the United States meets there. Some of the delegates to that convention are brickmakers from various portions of the United States; at all events, a good many will go there, anyhow, and if this convention should meet in Philadelphia, or any other Eastern city, probably some of the members would be killing two birds with one stone. I would suggest that Mr. Randall leave the matter to the executive committee with the expression he's already received. I regret that we havn't got a single member from the city of Philadelphia participating with us at this session of the convention.

Mr. Blaffer—I'd like to add that tonight I believe will be the last time we'll all be here and I've taken the liberty to arrange with the steward for a big long table that we all might take a final supper together—this whole Association; and we'll have that supper, say, at half-past seven o'clock, and if there's any sentiments to express on that occasion we can do it and let every man speak what he has to say and bid a final adieu.

Mr. Purington—I want to extend an invitation to the local brickmakers of Memphis to take supper with us.

Mr. Randall—And I want to include in that invitation the members of the press. I think it's now high time to adjourn, at least a motion to that effect will be in order.

On motion, the convention adjourned *sine die*.

PORTSMOUTH FIRE BRICK WORKS.

An illustrated number of the Portsmouth (O.) Blade has a large cut of the above works. The officers of the company are: President, W. Q. Adams; Vice-President, Reuben Jenkins; Secretary, Leslie C. Turley. The original plant, established in 1881, had a capacity of 8,000 brick per day; increased in 1886 to 16,000, and has been increased lately until their daily output is 28,000 per day, with a pay roll of $1,200 per week. This plant has been in full operation for seven years, with but two or three stops of only two or three weeks duration, which speaks favorably for the quality of goods turned out.

THE CLAY-WORKER

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THE CLAY-WORKER FOR 1889.

With this number of the CLAY-WORKER we commence Vol. XI. We are particularly gratified with the fact that the new year opens auspiciously in many respects. The general trade outlook was never better. From all parts of the country the word comes to us that extensive preparations are being made to build the coming season.

The great clay working industries of the country are fully alive. Large plants are being put in at important points for the manufacture of brick of all kinds, terra cotta, etc. The use of brick for road and street making is exciting a great deal of attention. The work of paving streets and highways with brick is well begun in several states, and the results are so satisfactory after eight, ten and fifteen years' use that too much can hardly be said in commendation of this method of permanently improving streets and highways. THE CLAY-WORKER has done what it could to educate in this direction. In every advance movement in clay working our columns have been open to aid in spreading broadcast every practical suggestion or thought that might serve to quicken the public heart beat.

We have in the past endeavored to furnish our readers with the experience and thought of leading men on all questions relating to clay working. In addition our illustrations have been suggestive and educative. In the future as in the past we shall not count the cost of keeping to the front.

In entering upon the eleventh volume our facilities are better than at any time since the initial number came from the press, and we will enlarge our facilities as the needs may indicate, to meet promptly and fully every demand of the clay working craft.

We have the pleasure of saying that at no period in the publication of the CLAY-WORKER have we had such an accession of subscriptions from all parts of the country. We expected much but we have happily received more—*much more*. Our advertising patronage speaks for itself.

All in all we have every reason to be proud of the work already accomplished and to anticipate still greater success and prosperity. Our watchword is *progress* and we shall strive earnestly to serve and advance the best interests of the craft that its brightest prospects may be fully realized.

HOOSIER LUCK.

Indianapolis can surely count itself among the luckiest and most prosperous cities in the Union. We now are enjoying natural gas; one of nature's rarest blessings. Every one is proud of "Little Ben," our new President whose splendid abilities will bring added honors that must reflect credit upon us all. Commercially we are taking long strides. Our industrial interests are prospering in a greater degree than ever before and whatever may have been the sentiment in earlier times it is now a fortunate thing to be a Hoosier and particularly a Capital Hoosier.

Our local brickmakers are confidently anticipating a boom the coming season. Already contracts are being made for early spring delivery and the indications are that more building will be done in 1889 than in any former year.

A CHANGE OF DATE.

The Illinois Tile and Drainage Association adjourned one year ago to meet on the third Tuesday and Wednesday, January 15 and 16, 1889, and the announcement was so made in our last (December) issue. The programme committee has however seen fit to change the time of meeting to Monday and Tuesday, the 21st and 22d, and have sent out programmes to that effect since the December Clay Worker went to press.

We are informed that the date was changed on account of other meetings that would occupy the available room in the State House. It would have been better, we think, had the time adjourned to been observed even though the convention had to meet in some hall in the city instead of in the State House. It seems to us that the interests involved are too important to be thus compelled to take a back seat to make room and place for any and all other organizations.

Confusion of dates is always disastrous to these meetings and if the "powers that be" find it necessary to alter the date of meeting they should at least notify the press in time to permit of proper notice.

Our readers will note that the convention will meet Monday and Tuesday, 21st and 22d, in the State House at Springfield.

OPEN TOP KILNS.

The proper management of open top kilns especially in burning drain tile is discussed in a practical manner in the January number of the Drainage Journal as follows:

"While it is true that open top kilns are not generally in good favor among our leading tile manufacturers, it is also true that there are quite a number of them in use. They are not the best kilns, but they serve a good purpose oftentimes, where the burner knows how to burn in them. Indeed we know some who burn excellent tile in open top kilns. The suggestions that we make have a practical side in our judgment that will apply to other kilns in some respects. They are briefly as follows: Set the tile a little open in the corners and at points where the difficulty of getting a draft of heat is experienced. Make the openings over the heat flues larger at such points so as to allow the heat a freer passage, and closer at the points where it has been inclined to draw heretofore. In bringing the kiln to a red heat after the watersmoke is off, keep the spots that have been inclined not to burn, well in advance of other portions of the kiln. It is pretty well known to burners, that the hot places tend to get hotter. It will be well to keep the side arches where the tile have not burned well heretofore, in advance in the heating to watersmoke. The general firing of the kiln after the red heat point has been reached should look sharply to the points suggested. Where there is a tendency in one portion of the kiln to fall behind, the burner may increase the heat in the better fuel used or by using a fuel that will send a flame up through the ware, and thus increase the draft of heat at the point desired. After a high heat has been reached in the kiln, except at such points as are inclined to lag, it is the practice of some, in the use of open top kilns, to open the platting in the center of the cooler spots, and set three or four large tile on top of each other, setting them in the opening in the platting. The tile serve as a flue to increase the draft and draw the heat through the cold spots. Others cover the hot spots of the kiln tight, and in this way drive the heat where it is wanted, which may be done by covering with sheet iron, and afterwards throwing three or four inches of dirt on the iron. By tight platting in the way suggested the heat can be taken to the sides, or to the center, or to the center and sides, as may be desired.

"Again we call attention to the heat flues. They may not be large enough or open enough on top, or too open; also the setting of the ware of any kind, will have much to do with the result in burning. The burner should be a man of good practical horse sense, quick to observe what is going on, and always ready to apply the necessary means 'to get there' as the boys say. 'Talent' may know why this and that should be done, but it is 'tact' that knows how, seizes the opportunity and does it. The 'tact' men are in demand for burners. They make all kinds of kilns go."

TRADE PUBLICATIONS.

The Gurney Brick Machine Works, T. C. Gurney, proprietor, Milwaukee, Wis., send us their Catalogue for 1889. It is a neat 28-page pamphlet. Send for a copy.

The New York Belting and Packing Co., New York, have just issued a new pocket Catalogue of their well known Vulcanized Rubber specialties, which will be cheerfully forwarded to those making application for same. It is very neat and handsomely gotten up, with illuminated cover printed in six colors.

The Lidgerwood Manufacturing Co., 96 Liberty Street, New York, have just issued their new Catalogue for 1889. It is a beauty, and a credit to this enterprising concern. The book contains fully a hundred excellently executed engravings of their superior Hoisting Machinery, Boilers, Etc., and will be forwarded to those making application.

The Henry Martin Brick Machine Mfg. Co., of Lancaster, Pa., favor us with one of their Illustrated Catalogues for 1889. From the title page, which is very neat and tasteful, to the last page it is filled with cuts and descriptions of and testimonials for the well-known Martin Machines, which, they claim, embody all the latest improvements in soft mud machinery. A copy will be sent to any of our readers on application.

We have received a handsome Catalogue from Jonathan Creagers' Sons, of Cincinnati, O., containing illustrations and descriptions of the Grand Automatic Brick Machine and other clay working machinery manufactured by them including a full line of brick yard supplies. The catalogue embodies some novel features that will amuse as well as enlighten the craft. They desire every brickmaker in the land to write for a copy mentioning the Clay-Worker.

A WORD TO SUBSCRIBERS.

We are indeed gratified by the promptness of a vast number of our subscribers in remitting for 1889. We also heartily appreciate the many kind words and good wishes that have come with the dollars. However there are many yet to hear from and to them we address this request: In remitting if you send private check please add 20 cents to cover cost of collection. We think it a good plan to send check as that is in itself a receipt, but please don't forget to add the 20 cents.

EDITORIAL NOTES.

Mr. C. S. Cowles informs us that there are large beds of fine clay near Wilkesboro, N. C., and as there will soon be one and perhaps two railroads there, making it an excellent opening for a brick and tile plant.

The Indianapolis Pottery Co. are prospering. Their business for the past season was very satisfactory, anticipating a still larger demand for their ware the coming season, they will improve their plant and increase their capacity.

Demand for brick throughout the South has been quiet for the past two months, but brick manufacturers are preparing for an extensive trade in the early spring and summer. There will be large quantities of brick used in all the Southern cities for sewer purposes as well as buildings. Knoxville, Tenn., alone, it is estimated, will use twenty-five million bricks this year.

We are frequently asked if we know of some good, practical man wanting a situation, or if we know of an opening for such a man and whenever we can do so we take pleasure in giving the desired information. However, to all who are seeking situations or to those who want experienced help we commend our "Wanted" column as the surest means of securing what is desired and our readers will do well to look to it as an easy and economical means of supplying their wants.

As we go to press (January 18th) the weather is as mild and warm as a spring morning. The winter is half gone and we have had but one snow sufficient to cover the ground, and it remained with us but a few hours. In most part the days have been bright and cheery with night freezes—delightful weather. Building has progressed much the same as at other seasons of the year, foundations laid and walls erected as if the frost king no longer held sway.

The Hillsdale Fire Brick & Tile Co., Hillsdale, Ind., are making an excellent fire brick. They consider themselves especially fortunate in the character of their clay. Mr. W. L. Raynes, of that firm, made a brief call a few days since, he had a sample of the clay and a sample brick, which they make on an Invincible Brick Machine made by the Eagle Machine Works Co., of Indianapolis. The brick burn a cream white and so far as tested have stood the severest test. They have also an inexhaustible bed of red clay suitable for pressed brick and terra cotta. They will also manufacture fire proofing, as soon as the machinery can be placed in position and necessary kilns erected.

A CHEERFUL LAY BY A SWEET SINGER.

Editor Clay-Worker:

Enclosed herewith please find one dollar to renew my subscription to the Clay-Worker for another year.

I cannot allow this opportunity to pass without congratulating you upon the ability you display in writing your articles. It is easily seen by practical men that you are men who have yourselves had experience in the working of clay into brick and tile. Your Clay-Worker must be of great value to all manufacturers of brick. I for one read with a great deal of pleasure each number as soon as it comes.

I have been in the business for over thirty years and have a yard now making seven millions a year, yet I find some very useful and profitable information in your paper.

Wishing you the compliments of the season I am, Respectfully Yours,

THOS. NIGHTINGALE.

Toronto, Canada.

NEW ADVERTISEMENTS.

Fletcher & Thomas,
Brick Yard Supplies.
St. Louis Iron Works,
Dry Press Brick Machine.
Jonathan Creagers' Sons,
Brick Machinery.
Anderson Foundry & Machine Works,
Chief Brick Machine.
F. Huetteman & Co.,
Brick Machine.
Grand Automatic Br'k Mach. Mfg. Co.,
Clay Working Machinery.
Benj. Craycroft,
Eagle Brick Machine.
National Brick & Truck Co.,
Barrows and Trucks.
Eagle Machine Works Co.,
Invincible Brick Machine.
I. & M. Wolff & Coleman,
Iron Clad Dryers.
H. O. Whitney,
Andrus Brick Press.
Small Ad's, For Sales, Wanted, Etc.

EDITORIAL NOTES and CLIPPINGS.

Epping, N. H., is to have a pottery.

A brick yard will be started at London, Tenn.

Stuart Bruce will build brick works at Bonifay, Fla.

Large brick works are being built at Inglewood, Cal.

The Trion (Ga.) Manufacturing Co. will start a brick yard.

Chas. Frost & Co. will build a brick plant at Marble Falls, Tex.

Geo. W. Shaffer will start a steam brick yard at Spencerville, O.

Sims & Barnett intend to enlarge their plant at Washington, Ga.

W. A. Squires is preparing to start a brick yard at Henrietta, Texas.

Lewis Jones' Pottery at Pittsboro, Pa., was burned recently. Loss $10.000.

Henry Smith & Co., Horseheads, N. Y., intends to build an artificial dryer.

Sam'l Gibson & Co's brick dryers were burned recently, cause—natural gas.

The Ouchita Coal Co., of Camden, Ark., will establish brick and tile works.

Read the "For Sale, Wanted, Etc.," columns. You may find something you want.

Brannan's Pottery, at East Oakland, Cal., was partially destroyed by fire January 1st.

The Meyenberg Brick Co., of Chicago, have made an assignment. Liabilities, $40,000.

James Sandison, of Morberly, Mo., in renewing his subscription says: "Don't stop my Clay-Worker, I can't do without it. I have bought all my machinery from ad's in it."

The Rochester (Pa.) Pottery Co., want a clay knife for trimming ware when it is green.

Wm. Alsip & Son, formerly of Chicago, are now operating a brick yard at Watertown, Dak.

W. M. Neal and others have organized a brick company and will build a plant at Helena, Ark.

The Brady's Run Fire Clay Co., of West Bridgewater, Pa., has been chartered. Capital $40,000.

W. C. Green Brick Co. are putting in Morrison Kilns on their large brick works at Wichita, Kan.

A. N. Forsyth, Greenfield, Ind., will build a brick yard and may make roofing tile and paving blocks.

Hall & Barr, of Cedartown, Ga., will put in a brick plant and be ready to manufacture brick in the early spring.

The Brockway Brick Co., of Fishkill, N. Y., has been incorporated. Capital, $100,000. Edwin Brockway, President.

While drilling an artesian well at Yankton, Dak., a vein of potters' clay was penetrated to a depth of 150 feet.

The Ohio workhouse board at Toledo have ordered the purchase of a brick machine having a capacity of 20,000 a day.

Salmen Bros., of Slidell, La., want to put in artificial dryers this winter and will increase their output this coming season.

Benj. P. Morrison, Abingdon, Va., wants information on the manufacture of clay tobacco pipes, especially the making of moulds, etc.

A new firm which will give its attention to the manufacture of building and ornamental brick has been organized in Fort Dodge, Ia.

N. J. Cruger, of Albany, Ga., is putting in Morrison Kilns and hot floor dryers this winter and preparing for a large trade next spring.

The Barrington (R. I.) Brick Co., has been organized with capital of $150,000. They will erect a modern plant of 100,000 a day capacity.

A. J. Hamil will organize a company to manufacture brick and tile near Americus, Ga. He may also want to purchase sewer pipe machinery.

The Pontiac Brick & Tile Co., of Seattle, W. T., has been incorporated by M. J. Carkeek. J. A. Harrington and Chas. J. Fox, Jr. Capital stock, $12,000.

C. Hawks, a St. Paul, Minn., banker, has purchased the brick yards at River Falls, Wis., and will run them night and day making 50,000 brick every 24 hours.

Mason City (Iowa) is thought to offer exceptional advantages for the establishment of a large brick plant. They have an almost unlimited amount of fine clay.

The Austin (Minn.) Pressed Brick Co., will put in a new 100-horse-power engine and other machinery. They expect to commence making brick again March 1st.

The Brown & Harrop Mfg. Co., of Portland, Ind., are having an excellent trade in Brick and Tile Machinery. They recently shipped two outfits to parties in Canada.

The Tennessee Brick & Mfg. Co., of Memphis, Tenn., will add a line of soft mud machinery to their plant the coming season and will be pleased to receive catalogues of improved machines.

Kelly Bros., of New Orleans, La., (47 Carondelet St.) are thinking of engaging in the manufacture of roofing tile and desire to communicate with parties who can furnish machinery for that purpose.

Chambers Bros. Co., of Philadelphia, call especial attention to their Iron Dry Cars and Iron Pallets of which they manufacture several styles suitable for all the different artificial brick and tile dryers.

A. J. Boyce's Pottery Machine Works, East Liverpool, O., was totally destroyed by fire Jan. 3d. Loss, $20,000; insurance, $14,000. This is the second time this works has been burned out within a few years.

The Abendroth & Root Manufacturing Co., 28 Cliff St., New York City, makers of the popular Root Sectional Safety Boiler has been obliged to enlarge its plant at Green Point, L. I., to meet the demand for its specialty.

Milton F. Williams & Co., of St. Louis, Mo., are manufacturing a patent cluch pulley that is proving very popular wherever introduced. They (the manufacturers) have received a great many flattering testimonials from those using them.

The National Terra Cotta and Brick Co., of Bethell, Kan., has been incorporated. Capital stock, $250,000. Directors: W. P. Carter and Holger Ohmeyer, of Bethell; C. A. Merrill, of Kansas City, Kan.; W. P. Longworthy, of Kansas City, Mo.

The Knoxville (Tenn.) Brick Co., are now turning out 50,000 brick a day at their works at Powell's Station. They have an abundance of excellent clay and contemplate the addition of sewer pipe and fire brick works to their already extensive plant.

On page 63 we introduce to the trade the Lyons Brick Press. The high praise given the Lyons' Machine by those who have used it during the past year or two entitle it to considerate attention from those contemplating the purchase of dry press machinery.

The Steubenville (Ohio) Pottery Co. has decided to build an addition of three kilns to its present plant and to erect a new Pottery adjoining. The cost of the improvements will aggregate $50,000 and will give employment to about 100 additional hands. The new Pottery will make C. C. ware.

The Eureka Brick Machine Co., of St. Louis, Mo., have removed their offices to the Laclede Building, that city, and will be pleased to have visiting brickmakers look in upon them. We may say, by the way, that the Laclede is one of the finest and most elegantly finished Office Building in the U. S.

Henry Ritter, of Burlington, Iowa, in renewing his subscription, adds: "We made over two millions of brick last year all the old way—by hand. Would put in machinery if we felt certain that we could work it satisfactorily and to an advantage over the old way. We dry by the pallet system and on the open yard and burn with wood."

We recently had the pleasure of witnessing the operation of the Boyd Brick Press in the shops of the manufacturers, Messrs. Chisholm, Boyd & White, of Chicago, and was very favorably impressed with the appearance of the machine and the ease with which it turned out an excellent quality of brick. Two fine engravings of this machine is shown on pages 8 and 9.

A new Automatic Dump Car which possesses unusual merit recently invented by Mr. C. W. Raymond, of Dayton, O., will be ready for the market the coming season. Contractors and brick manufacturers contemplating the use of such an article will find it to their advantage to investigate the points of this car. Those in use have surprised their owners by their rapidity of work and general convenience.

Salmen Bros., of Slidell, La., have just burned a Morrison Kiln of four hundred thousand capacity which they built last fall. This kiln is thirty feet in width, but by a recent improvement of Mr. Morrison's his kilns can be burned any width desired. Mr. Salmen says this kiln burned as uniformly as the other, which was but twenty-five feet wide. Brickmakers will be pleased to learn that the difficulty of burning wide kilns with furnace attachments has been solved.

Messrs. C. W. Raymond & Co., of Dayton, O., are making a special study of the matter of ornamental brick work, designing of new ornamental patterns or manufacturing those submitted by architects. The manufacture of ornamental brick work and terra cotta which has received a new impetus by the advent of the Perfection Brick Press is now assuming large proportions, several large companies having placed their orders with Mess. C. W. Raymond & Co., for outfits for spring delivery. Their catalogue of 100 designs will soon be issued.

"THE CHIEF."

The record of this successful machine is indeed an enviable one. It is now well-known throughout the United States. The "Chief" invaded nearly every state in the Union last year the sales exceeding any previous season. The prospects now are bright for a still greater success during 1889. Special attention is requested to the following as a specimen of the many testimonials of good work done by the "Chief":

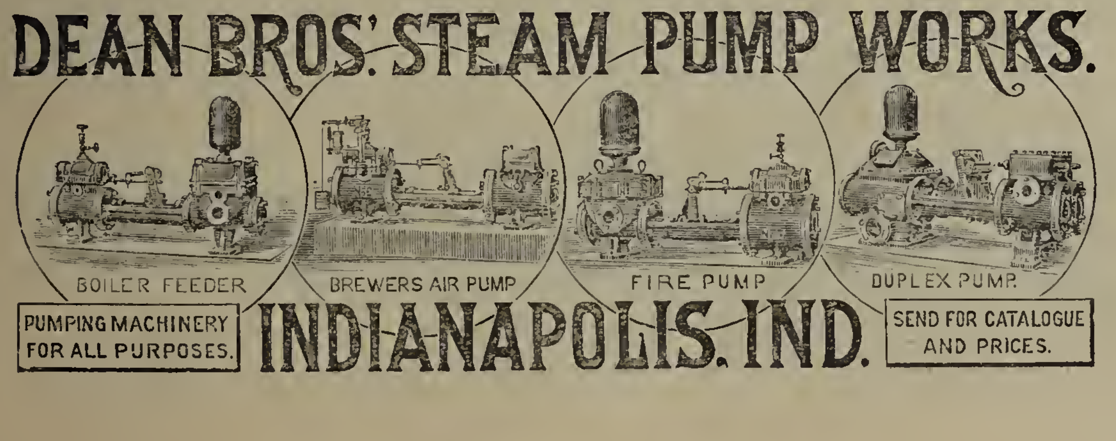
OMAHA, NEB., Dec. 26, 1888.

Anderson Foundry & Machine Works,
Anderson, Indiana:

Gentlemen:—Your favor of the 19th inst. at hand. Will say in reply that we purchased our first machine of you in 1886; in '87 one, and in '88 three. We now have five of your "Chief" machines. The first one purchased gave such good satisfaction that since then twenty-two more have been sold in this city. The quality of the brick is good, with sharp edges and full corners. We have no trouble in making 30,000 brick per day on each machine. In durability it is unexcelled by any other machine used in the city. We use no crusher, no pug mill and no soak pits; we work the clay direct from the bank, and soak it as it goes into the machine, which thoroughly grinds and mixes it. We use stiffer clay than can possibly be worked by hand. We are well satisfied with the "Chief" and can heartily recommend it.

Yours respectfully,
MICKEL, RILEY & CO.

MENTION THE CLAY-WORKER
When writing to advertisers
MENTION THE CLAY-WORKER.


DEAN-BROS' STEAM-PUMP WORKS.
BOILER FEEDER
BREWERS AIR PUMP
FIRE PUMP
DUPLEX PUMP
PUMPING MACHINERY FOR ALL PURPOSES.
INDIANAPOLIS, IND.
SEND FOR CATALOGUE AND PRICES.

Art and Home Decoration!

Send this advertisement and $4.00 (subscription price for 1889) DIRECT TO THE PUBLISHER, before January 1st, and you will receive

THE ART AMATEUR

From October, 1888, to December, 1889.

33 Beautiful Colored Plates,

Portrait, Fruit Flower, Marine, and Landscape Studies (for copying or framing) and charming designs for China Painting. Also

150 Pages of Useful Designs

in black and white, working size, admirably adapted for Oil and Water-Color Painting, China Painting, Church and Home Embroidery, Wood Carving, Brass Hammering, and other Art Work

350 Pages of Practical Text,

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3 MONTHS FREE

Including five *colored plates*, namely, a "STORMY COAST SCENE," in October; a "WATER LILY" and a "MOONLIGHT MARINE" in November; a "WINTER LANDSCAPE" and a charming female figure, "HEARTS ARE TRUMPS," in December.

NOW (before January 1st) is the time to send, together with this advertisement, $4 for 1889, and secure all that is offered above, including FOUR EPTRA COLORED STUDIES, "*Quiet Coast Scene,*" "*Little Rosebud (Child),*" "*Ferns,*" "*Birds of Paradise,*" making

33 COLORED PLATES!

FOR THOSE WHO SUBSCRIBE IN DECEMBER.

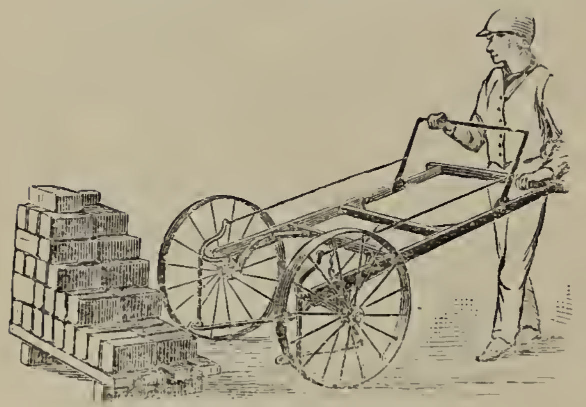
The Twenty-four Colored Studies for 1889 will include Autumn Landscape, Winter Landscape, Sunset Landscape, Sunset Marine, Jacqueminot Roses, Carnations, Daffodils, Tulips, Apples, Girl's Head, and others not yet chosen. *You are invited to state your preference without delay.* Address

MONTAGUE MARKS,
23 Union Square, N. Y.

FOR SALE OR RENT. All or interest in tile or fire brick factory; best of clays; cheap fuel; cheap freights; good demand for ware. Real estate or wares in part pay. Address "G" care Clay-Worker.
I. 1 d.

FOR SALE. We have one Vervallen h. p. Brick Machine, run two years in good repair, capacity 18 M, will take $100 Also one Wallace Crusher, run one season all complete, tight and loose pulley; will take $100 Also one Hand Press Miller pattern as good as new; will take $50. All loaded on car if sold.
C. B. HOLMAN & SON,
1. 2. d. Sargent's Bluff, Iowa.

STEELE'S IMPROVED Brick Truck —AND— Portable Hack.



The principle of handling and drying bricks by the Portable Hack System has been perfected in this Truck and VENTILATED HACK BOARD, being the most practical Truck and method ever yet introduced, saving labor in handling and time in drying bricks. Can be used in any yard not too steep. Is especially adapted for medium dry clay machines.

☞Is fully warranted to work as represented.

Orders Solicited.

Territory for sale in the Northern and Western districts. Address,

J. C. STEELE, Patentee,
Statesville, N. C.

The Link Belt Machinery Co.,

New York, Minneapolis.

CHICAGO, ILL.,
11 to 23 South Jefferson St.

BURR & DODGE, Philadelphia.

MAKE

ENDLESS TROUGH CONVEYORS,

Adapted to handling (on incline) clay direct from clay-bank, or pit.

METALLIC APRON CONVEYORS,

(Sometimes called clay elevators). Adapted to feed Brick or Tile Machine.

TILE ELEVATORS, (New Pattern),

Will elevate any size up to 18-inch. Send for Prices.

LINK BELT ELEVATORS (using buckets),

Will elevate Semi-Dry or Pulverized clay.

We are prepared to contract for the entire machinery required for a Complete Brick or Tile Works of any capacity.

Send for 1888 Catalogue.

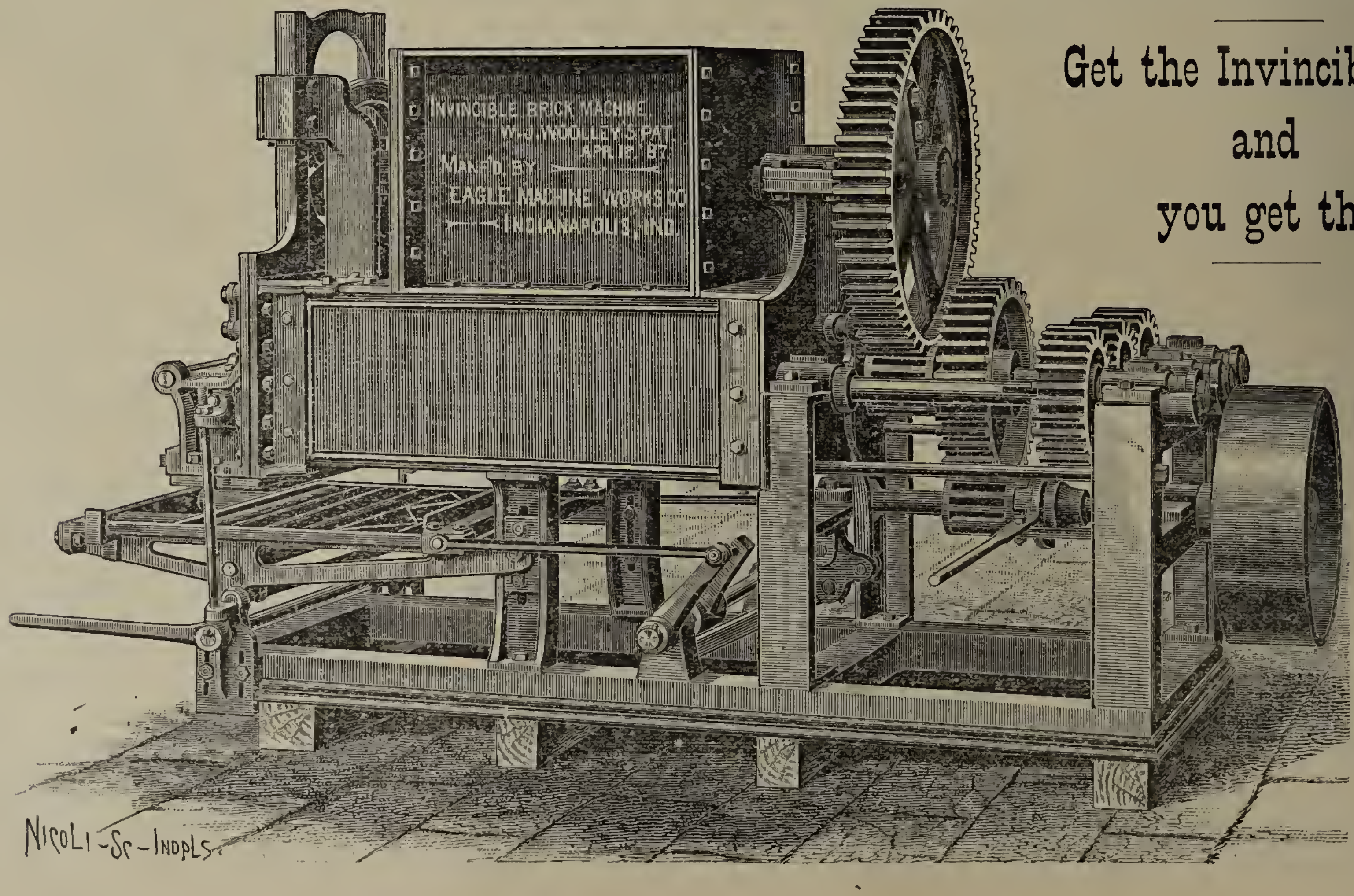
(Mention the Clay-Worker.)

The Invincible Brick Machine.

The STRONGEST, MOST DURABLE and BEST BRICK MACHINE in the market. Write for full description, prices, etc., to

EAGLE MACHINE WORKS CO., Indianapolis, Ind.

Get the Invincible
and
you get the best.

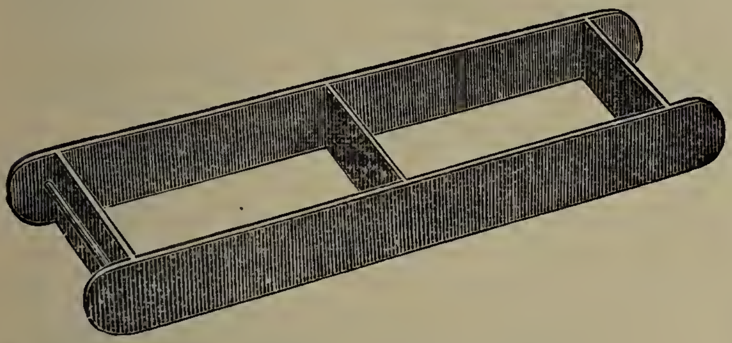


WILLIAMS' Cyclone Pulverizers, 36, 40 and 48-in. diameter.
" Revolving Clay Screens.
" Automatic Feeders and Mixers for Dry Presses.
" Grinding Tables for Sizing Brick.
" Clay Elevators.
" Clay Conveyors.
" Brick Trucks.
" Clutch Pulleys for Stopping and Starting.
" Friction Couplings.

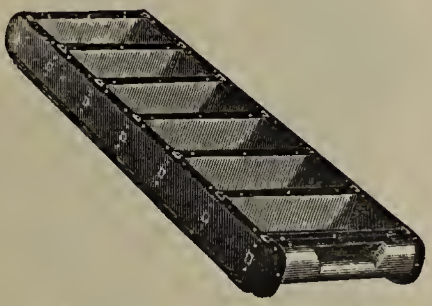
Write to **MILTON F. WILLIAMS & CO.,**
1417 and 1419 N. 2nd St., St. Louis, Mo.

STEEL MOLDS. With Special Machinery for manufacturing Steel Molds, we are able to guarantee ACCURACY, STRENGTH and FINISH

The best Steel Mold on the market.

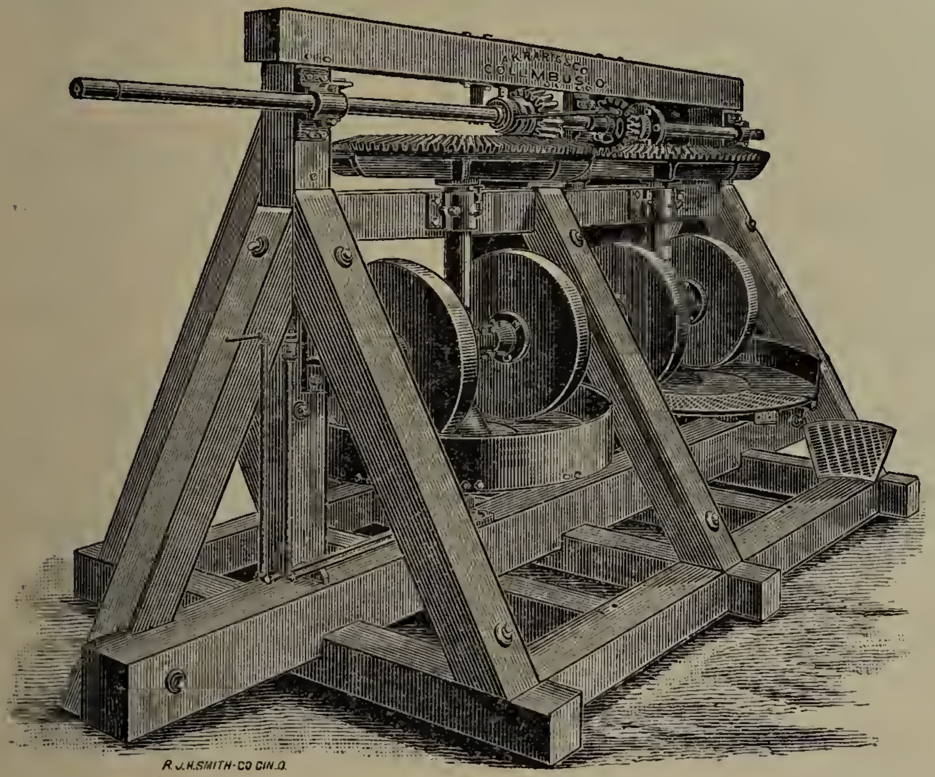


MACHINE MOLDS,
HAND MOLDS,
SHAPE MOLDS, ETC.



Write for prices on brick molds of all descriptions. **C. W. RAYMOND & CO.,**
Dayton, Ohio.

ALEX. K. RARIG & CO.,
Founders, Machinists and Boiler Makers, Columbus, O.



Office and Works:
Cor. Water and
Chestnut Streets,
near new Union
Depot.

Steam Sewer Pipe and Tile Presses, Grinding and Tempering Pans, Sewer Pipe, Tile and Fire Proof Dies, etc.; Automatic Cut-off and Slide Valve Engines, Boilers, Pulleys, Hangers and Shafting, Steam Pumps, Pipe Fittings and Architectural Iron Work.

AVERY'S SEAMLESS STEEL BUCKETS
FOR CLAY, ORE & ANY DAMP SUBSTANCE.
MANUFACTURED BY
THE AVERY ELEVATOR BUCKET Co
CLEVELAND. OHIO.
WE MAKE SEAMLESS STEEL BUCKETS FOR EVERY USE

This space is reserved for
THE NATIONAL BARROW & TRUCK CO.,
82 Fulton Street,
NEW YORK CITY,
MANUFACTURERS OF
Steel Wheel Barrows
For Handling
Sand, Clay, Brick, Coal, Etc.
—Also—
Wrought and Cast Iron Brick Drying Cars & Steel Pallets.

Our Barrows and Trucks are used largely by the brickmakers in New Jersey and along the Hudson River.

☞ Send for Illustrated Catalogue. ☜

FOR SALE, WANTED, ETC.

☞ ADVERTISING RATES in this column 20 cents per line, each insertion; about seven words make a line. ☜

FOR SALE. One-half interest in my brick plant. For particulars address A. V. MCKIRN,
1. 2. d 13 E. Levee, Kansas City, Mo.

FOR SALE. One Sword and Son Brick Machine, in good order; has been run three seasons. Will sell for $150. C. AMMAN,
1. 3. d. Decatur, Ill.

FOR SALE. Brick works at Anniston, Ala. Price low and terms very favorable.
A. D. GATCHEL,
1. 1. c. Louisville, Ky.

WANTED. A situation as foreman on a dry press brick yard; experienced in machinery, burning, etc. Address CHAS. BRADFORD,
1, 2, c Care Clay-Worker.

FOR SALE CHEAP. Fifty iron cars for use in drying brick or tile in tunnel dryer.
CYRUS KNAPP,
1. 3. d 339 N. Thirteenth St., Terre Haute, Ind.

FOR SALE. 16 Askins Oil Burners. These burners are as good as new having been used but twice. Will be sold cheap.
HYDRAULIC PRESS BRICK CO.,
12. 2. d. 304 North 8th Street, St. Louis, Mo.

FOR SALE. One new Forty (40) inch latest improved Stedman Clay Pulverizer. For particulars address SARGENT & VANZANDT,
1. tf. d Fort Worth, Texas.

FOR SALE. One Grand Automatic Brick Machine and Pug Mill, now in Anniston, Ala. Price, $125, or will sell the complete works at that place at a bargain. A. D. GATHEL,
o. 2. 1p. Louisville, Ky.

WANTED, a partner in an established brickyard. This is a good chance for the right man. Must have from $3,000 to $5,000. A young man preferred.
Address, P. O. Box 497,
1. 3. 1p. Omaha, Neb.

WANTED. A reliable partner with $1500 or $2000 to help start Pressed Brick and Tile Works in one of the best locations in the United States.
Address with references, "B." care Clay-Worker,
1. 1. d.

WANTED. A person with means to develop a large deposit of brick and terra cotta clay in Santa Barbara County, California. Good market. No competition. W. S. DIMMICK,
1. 2. c Carpenteria, Cal.

WANTED. Three nine-foot wet pans, with revolving pan and undergeared. State condition and price delivered at Harper, Ragan Co., O.
BUCKEYE PORTLAND CEMENT CO.,
1 1. c Bellefontaine, O.

FOR SALE. One latest improved Sword Brick Machine; 10 brick in wheel; complete; used only 30 days. Also one Brick Machine 18 brick in wheel, in good working order. Address
F. HUETTEMAN & CO.,
12. 2. d. 12 Sherman St., Detroit, Mich.

FOR SALE. One Kennedy Improved Dry Clay Brick Machine good order, cheap. One Martin Brick Machine, Pug Mill, Engine, Boiler, and everything complete for running. Address
D. P. SHENFELDER & CO.,
12. p. c. tf. Reading, Pa.

FOR SALE. Brick property on Long Island 30 miles from New York. Pallet yard capacity 30,000 per day. Brick selling $8.00; wood $3.50 cord. Rare chance. Address M. MEYER
1. 2. d Farmingdale, L. I.

FOR SALE. One Locomotive Boiler, 1 8x12 engine, 1 Quaker Brick Machine and Conveyor, 28 brick moulds. All in good working order. Will sell for cash or part cash and good notes. Sold on account of changing to dry process. Address L. B. CHEYNEY,
12. 2. d. 176 St. Clair St., Cleveland, O.

FOR SALE CHEAP. One Gurney 'Sand' Brick Machine, used one season. Also 1 Adrian 'Wire Cut' Brick Machine and one Potts Disintegrator, all in good running order. Reason for selling, we have changed our method of making. For particulars address
WISCONSIN RED PRESSED BRICK CO.,
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FOR SALE. Sixty (60) Ventilating Caps for brick drying houses. These Caps are 2 feet in diameter with 10-inch inlet and damper and are made out of galvanized iron, all in good condition. Address
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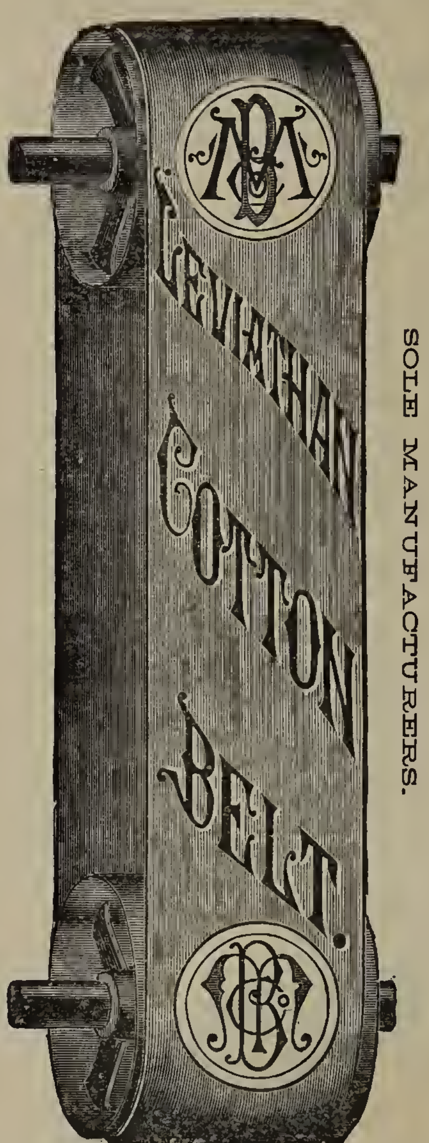

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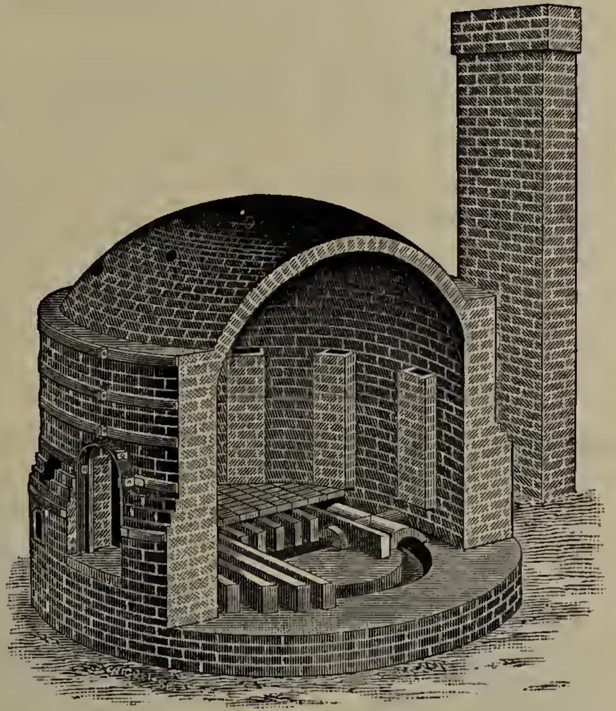

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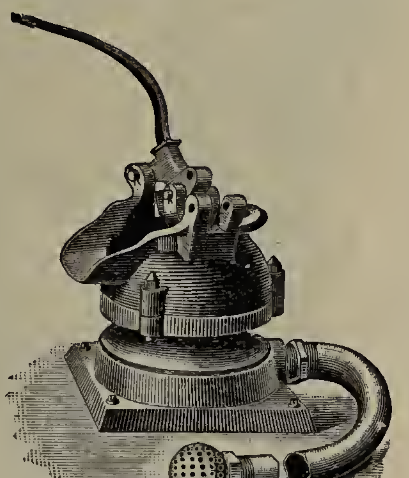

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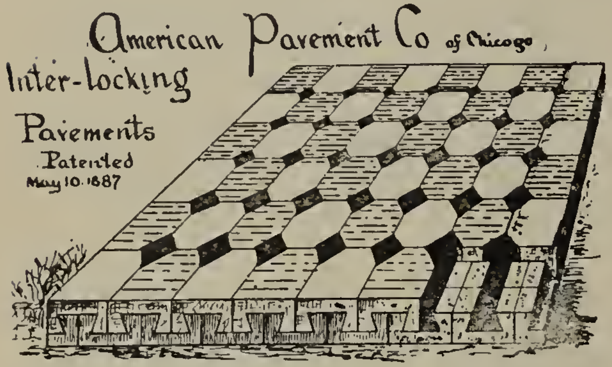

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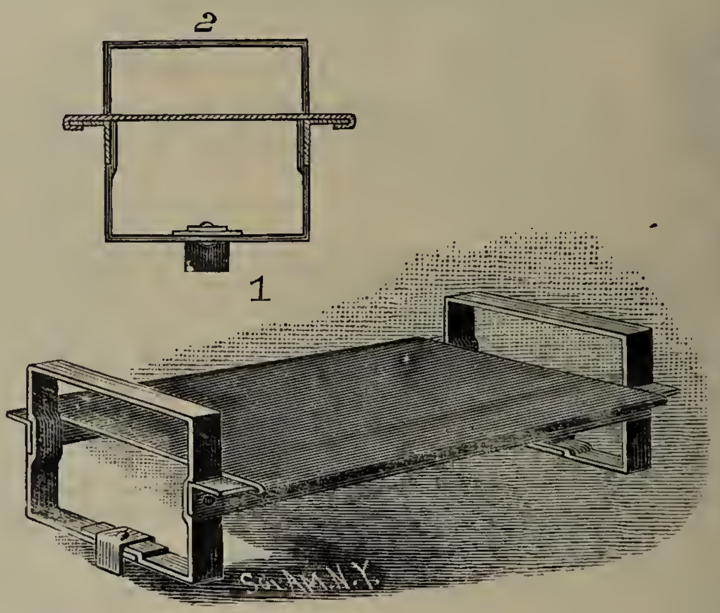

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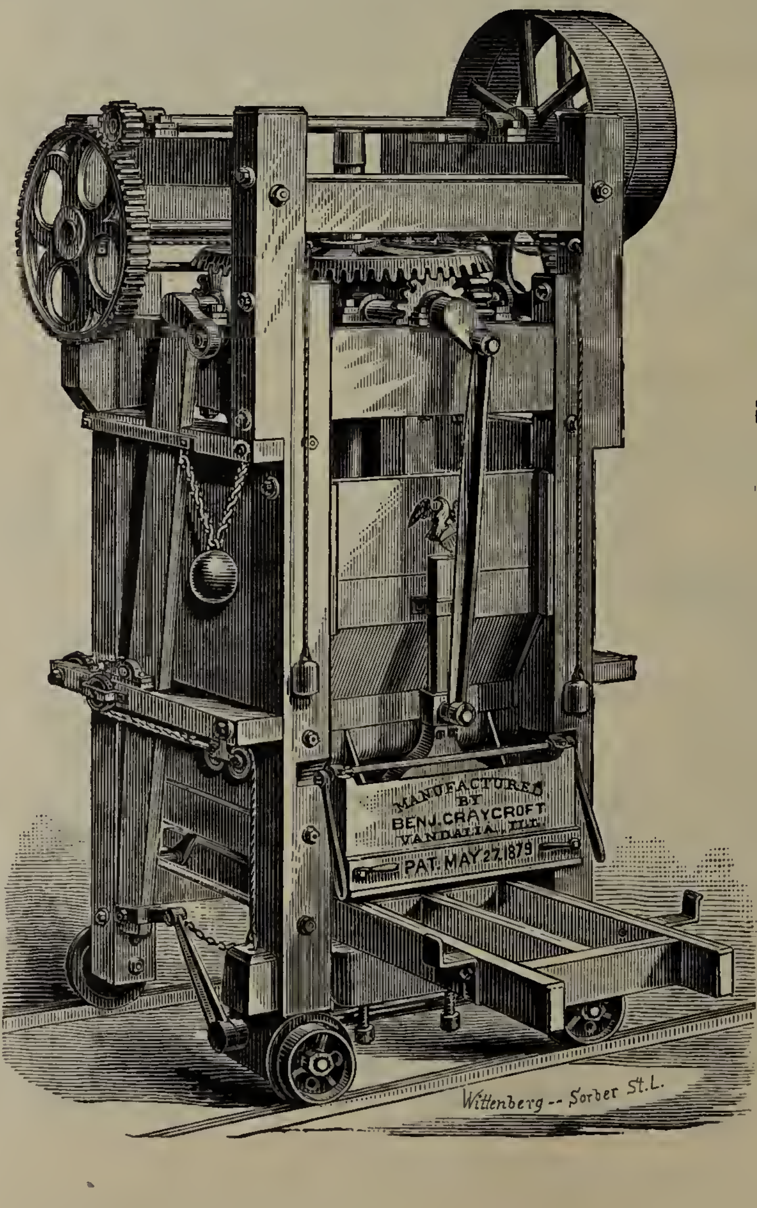
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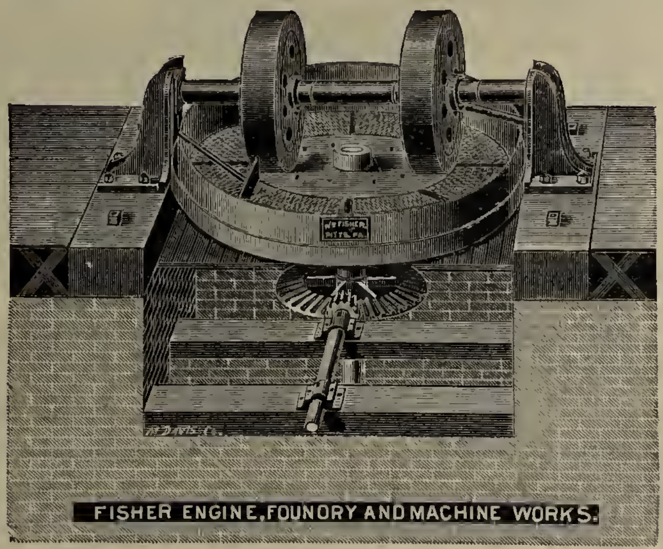
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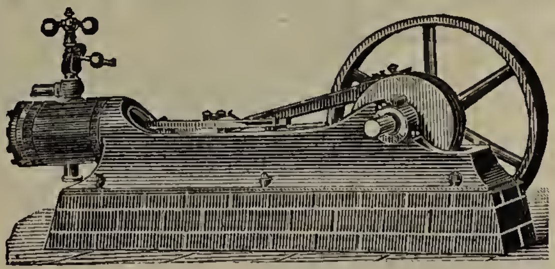

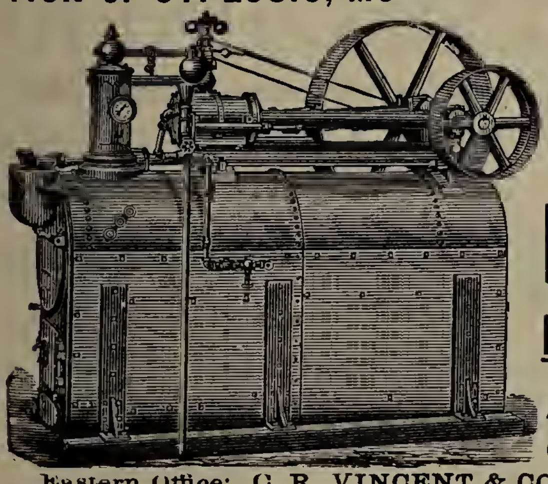

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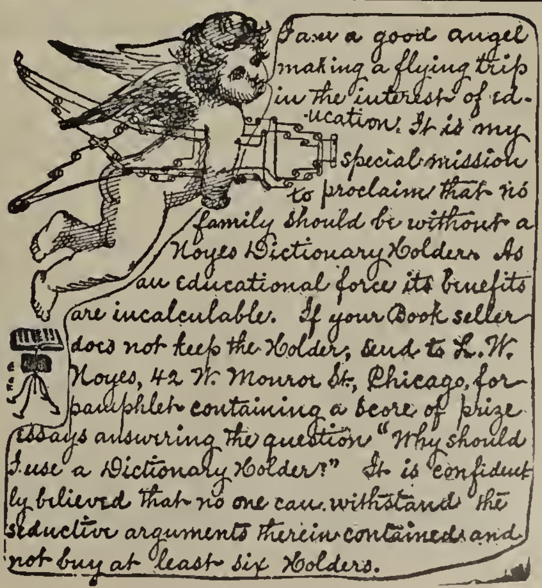

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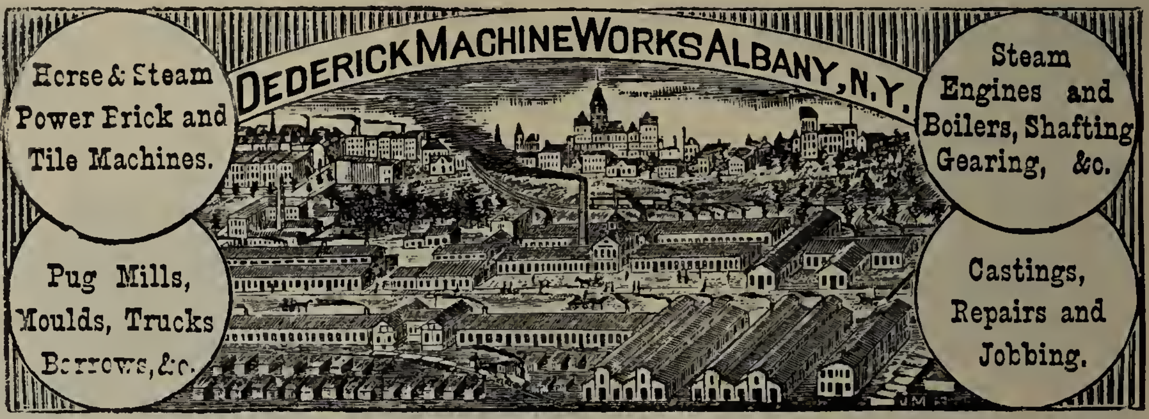
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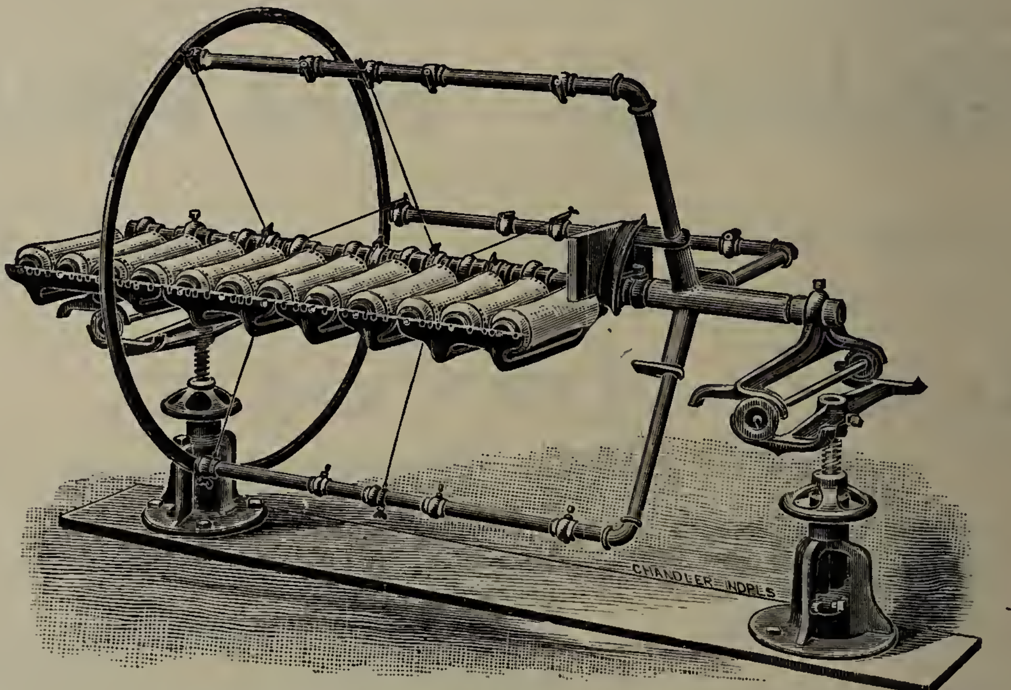

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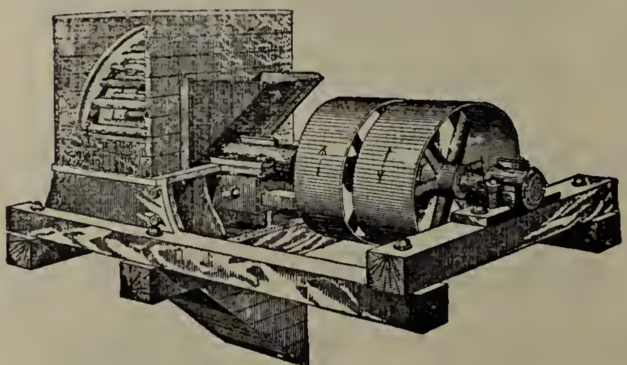

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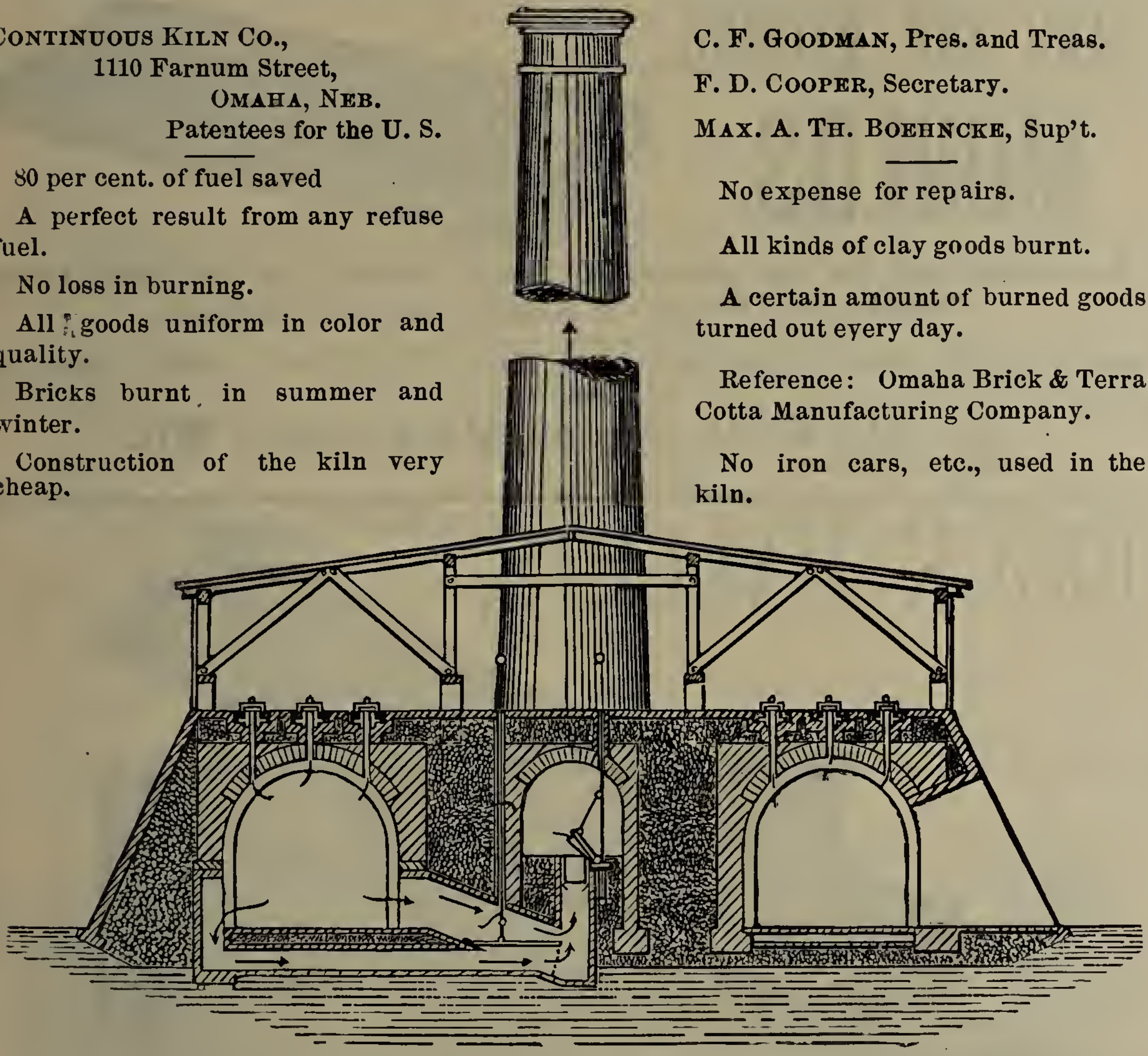

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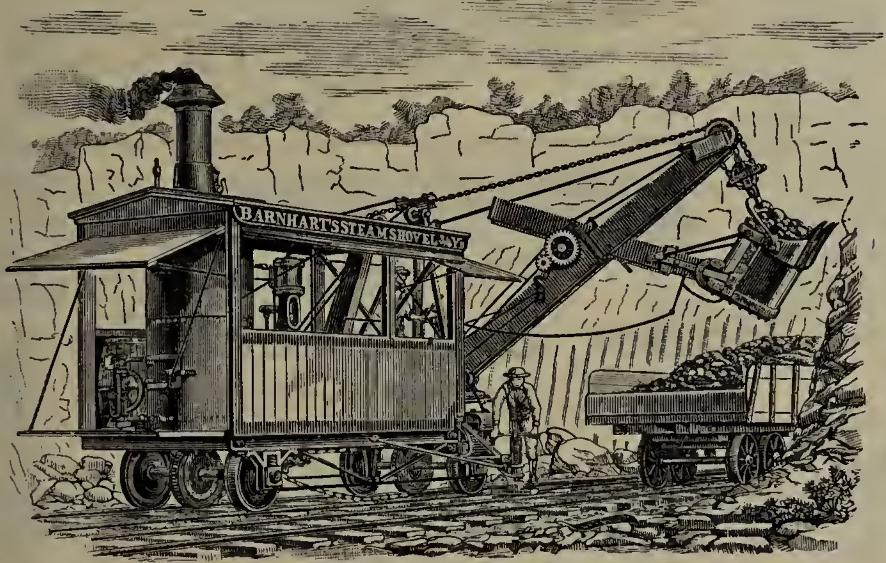

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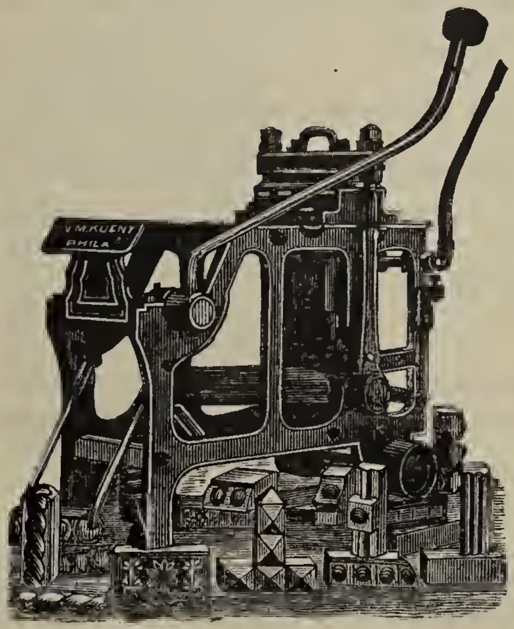
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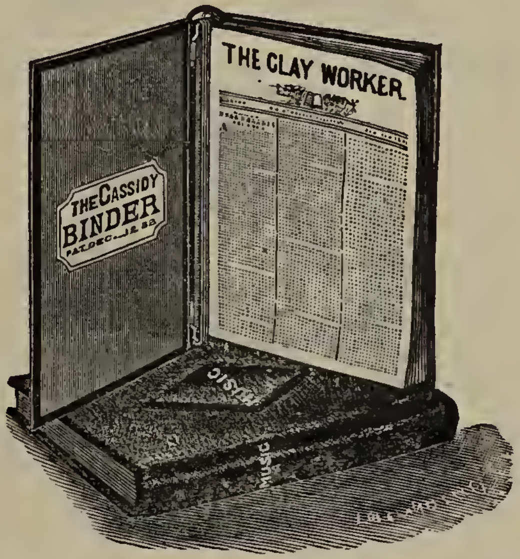

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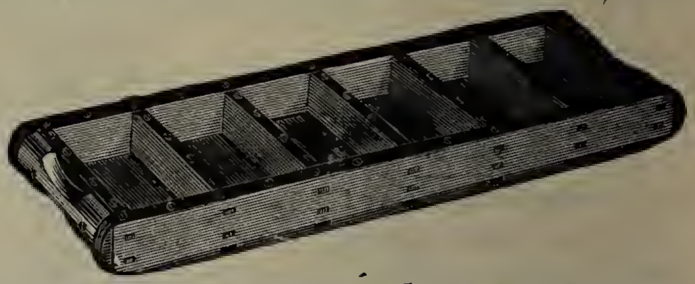

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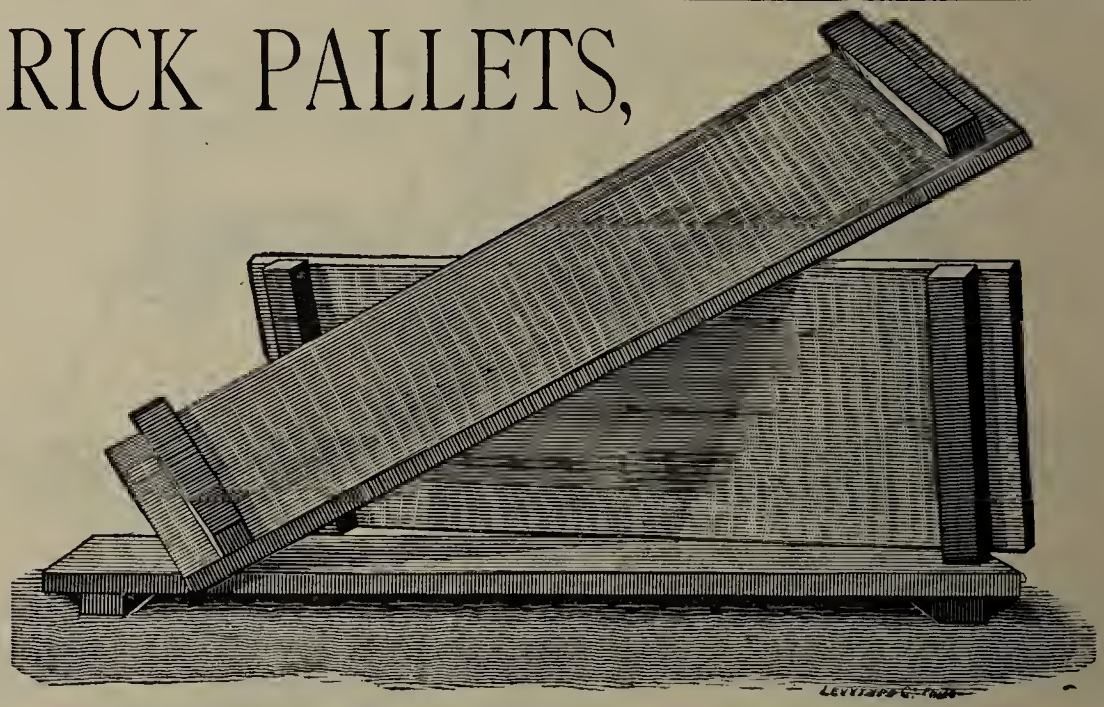

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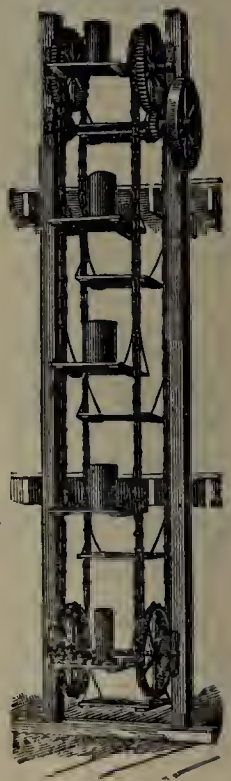

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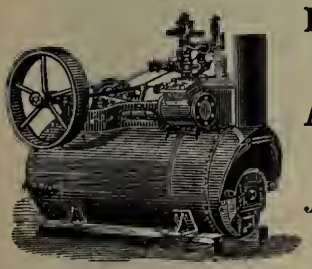

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Upright & Horizontal, Stationary & Semi-Portable.

ALL SIZES UP TO SIXTEEN HORSE POWER.

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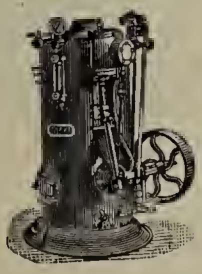

STEVENSON & CO.,

MANUFACTURERS OF

Steam Sewer Pipe Presses,
Dry Pans For Grinding Clay,
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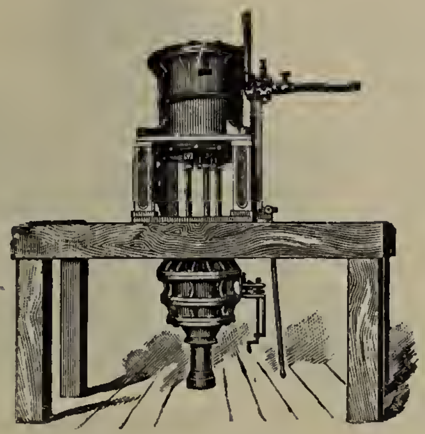
and All Kinds of



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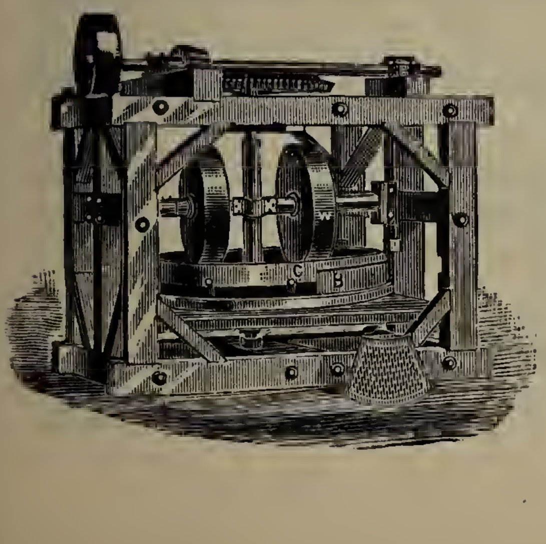

Parties going into the Sewer Pipe Business will do well to correspond with us in regard to Machinery, as we manufacture COMPLETE OUTFITS FOR SEWER PIPE AND FIRE BRICK WORKS.

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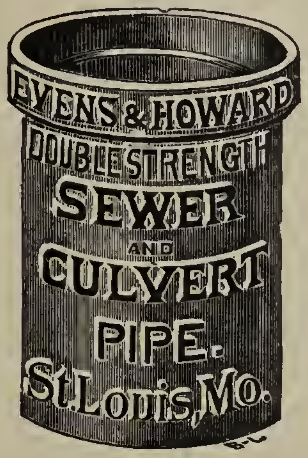

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Write or testimonials. See our circular: 'Culvert Pipe, Its Uses and Advantages."

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The new Chicago train on the Monon route leaves Indianapolis daily at 7:10 a. m. and arrives in Chicago at 1:55 p.m. Returning, the traim will leave Chicago daily at 11:40 p.m., and arrive at Indianapolis at 8:10 a.m.

Other trains will leave as follows:

Chicago Express, 12:01, noon, except Sunday; arrive in Chicago, 6:35 p.m.

Monon Accomodation, 6:00 p.m., daily.

Chicago Night Express, 11:15 p.m., daily; arrive in Chicago, 7:25 a.m.

In taking the 7:10 a.m. train, passengers or St. Paul, Minneapolis and other Northwestern points save twelve hours in time.

Remember that the Monon Route has come to the front and is now the leading Chicago line for the reason that no other Chicago line makes as quick time or runs three trains each way between Indianapolis and Chicago. Pullman Palace, Buffet, Parlor, Sleeping and Chair Cars on all day trains. Pullman Buffet, Parlor Cars on day trains. Elegant coaches on all trains. No other line runs a daily morning train to Chicago, returning the same day.

For further information call at ticket office, 26 South Illinois street, Union Depot, or Massachusetts Aavenue.

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Both East and West

The only line with solid trains to Bloomington and Peoria with Through Cars to principal Missouri River points in several hours less time than any other line. Also through Sleeping and Reclining Chair Cars via Danville to Chicago, making as quick time at lower rates than any other route. The short line to Springfield, Columbus, Ohio, and all points in Southern and Eastern Ohio. The Quickest and Only Route with Through Chair Cars to Urbana, Ohio, Bellefontaine, Kenton, Tiffin and Sandusky. The authorized differential route East with Quick Time and Through Tickets to Principal Eastern Cities from $1.00 to $1.50 less than regular rates. Trains at Indianapolis Union Depot

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*Daily.

All trains have the finest of Buffet Sleepers and Reclining Chair Cars. For tickets and full information apply to Geo. Butler, Gen'l Agent, at the Union Station, 42 and 44 Jackson Place, (opposite main entrance Union Station,) Indianapolis, or to any Agent on the line.

Look in local column for special notices of excursions, reduced rates, etc.

H. M. BRONSON, Gen'l Pass. and Ticket Agent
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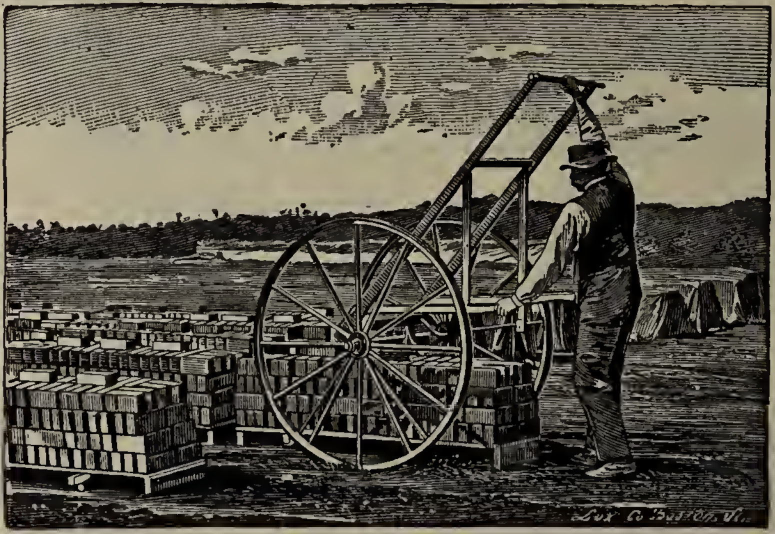
Economy Portable Brick Hake.

Patented Sept. 22, 1885, Re-issued Feb. 23, 1886. By
M. WALKER and E. MINER, Yankton, Dakota.



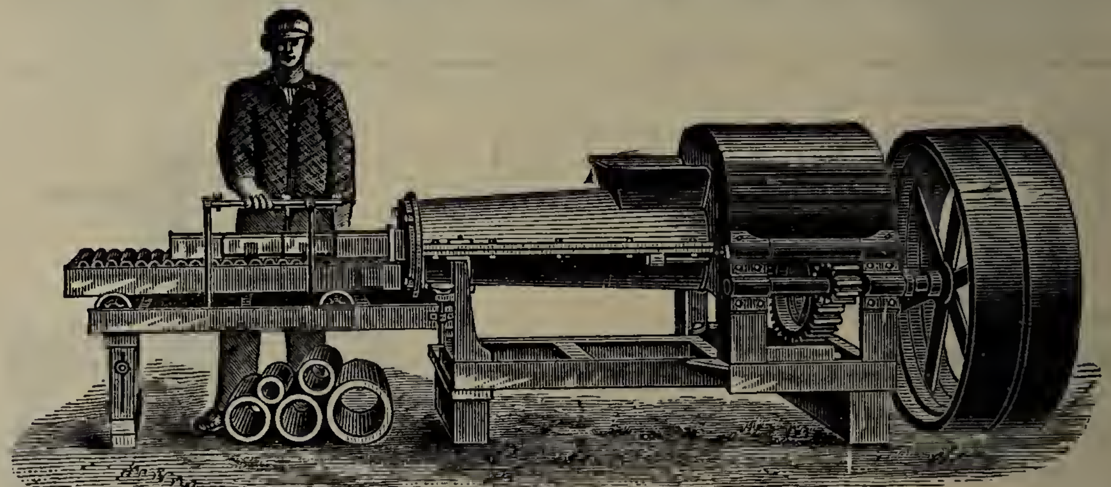
We desire to call the attention of all brickmakers to our PORTABLE BRICK HAKE, which certainly furnishes the cheapest and best means of handling brick from the machine to the yard, and from the yard to the kiln ever yet made use of. By this device the brick when taken from the machine are placed directly upon the haking boards, and when filled the haking boards are taken up by the truck and conveyed to the yard, where they are set down in rows end to end, where they remain until dry, when the truck comes again, picks up the hake of brick and takes it to the kiln. Thus one man does the work of four and the bricks go into the kiln in much better shape by not being handled while they are soft. We have a truck made especially for handling soft molded bricks on pallets. Yard County and State rights for sale. Please address for circulars and for further information,

YANKTON PRESSED BRICK CO.,

Or either of the undersigned, patentees,
M. WALKER, or E. MINER, Yankton Dakota.

KELLS & SON'S IMPROVED
Brick and Tile Machines!

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of Brick and different sizes of Tile by changing dies. For strength and durability we except none. We chalenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22, 1880 ; and February 12, 1884. We can furnish Crushers and also Trucks.

We can produce side cut Brick with our down cut-off, and make perfect edges and corners without the use of water or oil.

We have had Twenty-two Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 18 inches and on our No. 2 Machine we can make tile from 2½ up to 12 inches.

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IMPROVED

BRICK AND TILE KILN.

This Cut is a Representation of the Patentee's Works.

In this invention I do not claim perfection, for progress is onward. There is no end to human achievements. This I do claim, that the quality of the bricks it turns out, is as good as the best; being nearly all hard burned brick. That it takes less time, less labor, and consequently less fuel in burning than any other plan of brick kiln in use, and it is easily operated.

DESCRIPTION OF BRICK KILN AND FURNACES.

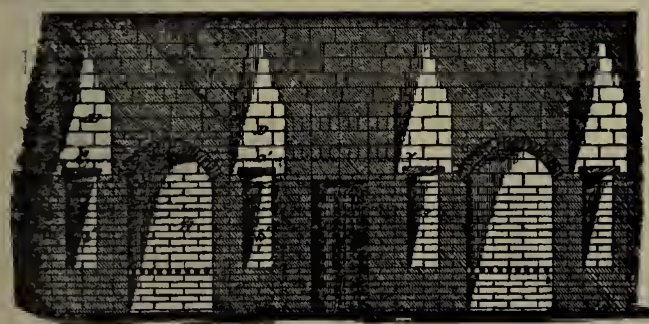

Fig. 1.

The peak holes not shown are the same as in the common case brick kilns, thus enabling one to see the state of the arches when burning. Fig. 1, is a front or side elevation with wall removed, which plainly shows the green brick kiln as it is built over the permanent mason work. Every bench alternately resting on the furnaces and the mason work which is the kiln floor. this floor is a perfect support to the crown of the furnaces. D. D. are the arches of the green brick kiln, B. the furnaces, b. b. the hot air chamber of flues. Fig. 2, is a horizontal section, showing the plan of the furnaces. B. represents the floor of grate surface, b. b. the hot air chambers. The way of the arrows show how the heat is circulated from the rear end of the furnace on each side horizontally in the hot air chambers, from thence vertically through the kiln floor or partition, having apertures into the arches of the brick kiln.

This brick kiln burns the brick of even hardness with but little fire marks. The arrangement of these furnaces are complete for perfect combustion. Also, in heating the arches of the brick kiln, there is no plan of furnaces that can equal them. The arch brick is hardly discernable and as perfect as any in the kiln.

I do not want a score of writers in their bearings to recommend this kiln *but let it stand on its own merits.* Every experienced brick maker knows that air let in through apertures at the sides or rear of furnace, it matters not in what shape, it will have a tendency to dampen the fires and cool the arches, the same will be the results, if in the rear holes it comes through the bed of coal while burning.

I have been many years engaged in the manufacture of brick, after experimenting and bringing this kiln as near perfection as it needs to be, I now offer to the brick makers yard rights, and right of terriiory, at reasonable prices, and am confident that such as may deal with me, after bringing into use this new arrangement for burning brick, will feel fully repaid for all their expenses.

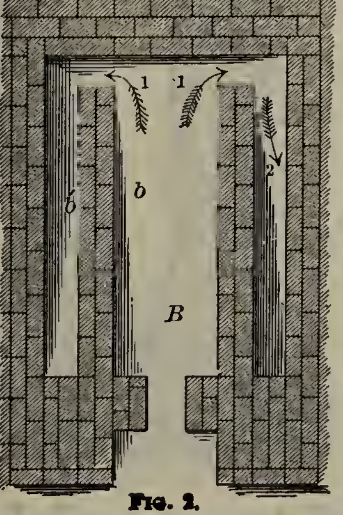

Fig. 2.

Any further information, as regards costs of Brick Kiln, construction of Furnaces, and all particulars will be cheerfully given by addressing

F. L. HALL, Patentee,
Oneida, Madison Co., N. Y.

THE

Pan-Handle

SYSTEM.

Its Territory, Facilities and Advantages Offered to the Traveling Public.

This system of railroads embraces the following lines: The Chicago, St. Louis & Pittsburgh railroad; the Jeffersonville, Madison & Indianapolis railroad, and the Indianapolis & Vincennes railroad.

The Chicago, St. Louis & Pittsburgh railroad is the Great Through Line to the East, via Columbus and Pittsburgh.

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The Indianapolis and Vincennes railroad is the direct and short line between the North, Northeast and the Southwest.

The facilities and advantages of the Pan-Handle System are in very particular in keeping with the progressive spirit of the times and the demands of the traveling public. Its facilities for the transportation of its patrons are sufficiently adequate to guarantee to all comfortable and pleasant accommodations.

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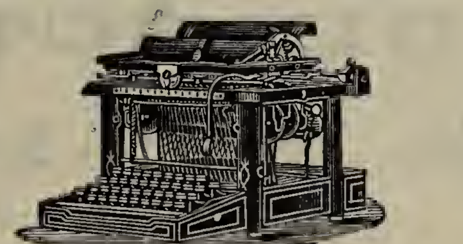

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The "REMINGTON has now been upon the market eleven years, during which time improvement after improvement has been added and the instrument as at present made is the result of the combined efforts of the best available inventive genius and mechanical skill.

We guarantee the superiority of our machines and give purchasers the privilege of returning them unbroken, at any time within thirty days, C. O. D., for full purchase price, if not absoulutely satisfactory in every respect.

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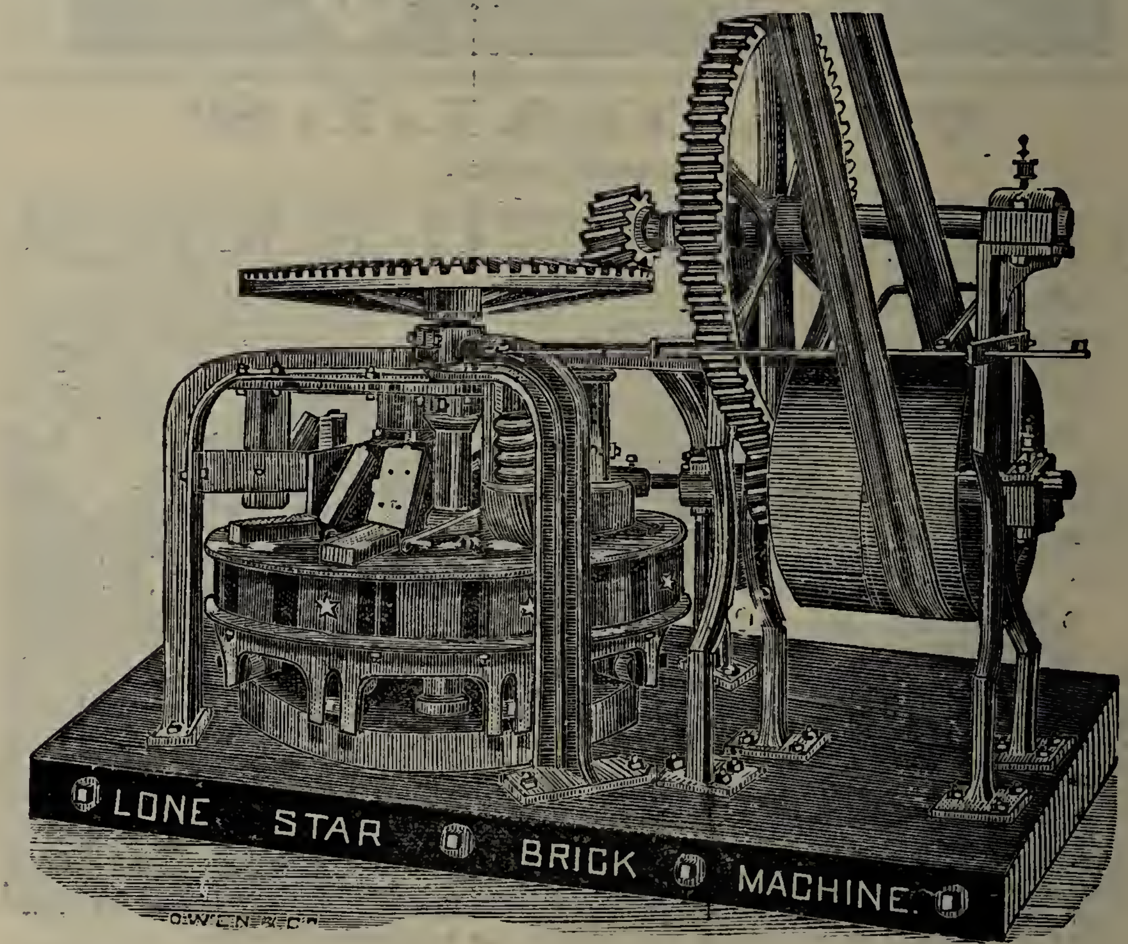
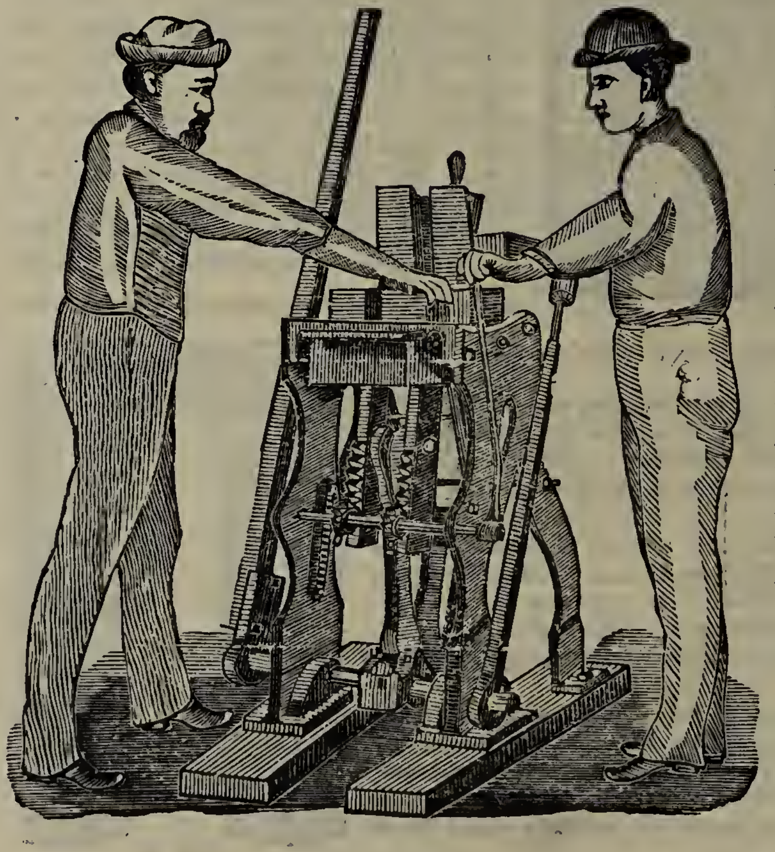
The New Improved
LONE STAR PRESSED BRICK MACHINE.


LONE STAR BRICK MACHINE.

This is the only Press that will work clay direct from bank in any degree of moisture from wet to dry. For Simplicity, Easy running and Fine Brick it has no equal.

THE LITTLE MAGIC WONDER
SEMI-DRY PRESS BRICK MACHINE



This machine works the clay in its natural state direct from bank. It is intended for small yards and will enable anyone to compete in the Pressed Brick line, with hardly any outlay. It will make as fine brick as any $5,000 machine under similar circumstances. For further particulars and circulars address

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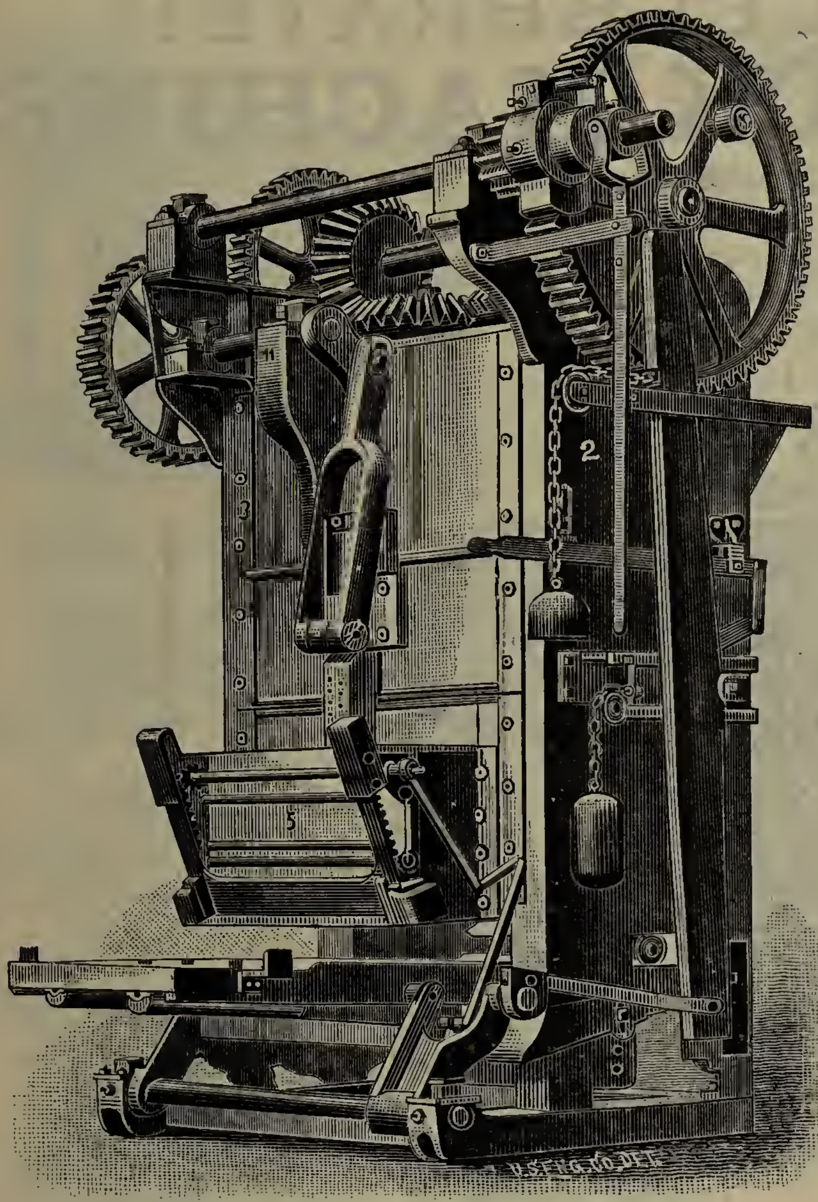
Catalogues will be sent only upon mention of this paper.

Send for cut of the New Improved [illegible]



THE DUPLEX BRICK MACHINE.

It is made entirely of iron and steel, strong and durable, has a large square tub, with two grinding shafts revolving in cpposite directions which gives it a pugging capacity superior to any other machine in the market. It has a powerful press adjustable drop-table, a very sensive mould-pushing device and safety friction clutch.

Twenty-two Duplex Machines and Elevators have been set up here in Detroit and vicinity alone the last two seasons, with third and fourih orders on hand for more. For catalogue and prices, address

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12 to 16 Sherman Street,
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☞ *Plans for New Yards and entire Outfits furnished and contracted for.*

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—MANUFACTURED BY—

A. M. & W. H. WILES,

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These Moulding Machines have been in constant use for over thirty years, and are the original of all machines now made that use a Pug Mill and Square Press, and they are the best and most economical machine now in use.

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We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

Mention the Clay Worker. **CORRESPONDENCE SOLICITED.**

WHITTAKER'S CELEBRATED
SEMI-DRY BRICK MACHINE

[Patented in U. S. May 13, 1884.]

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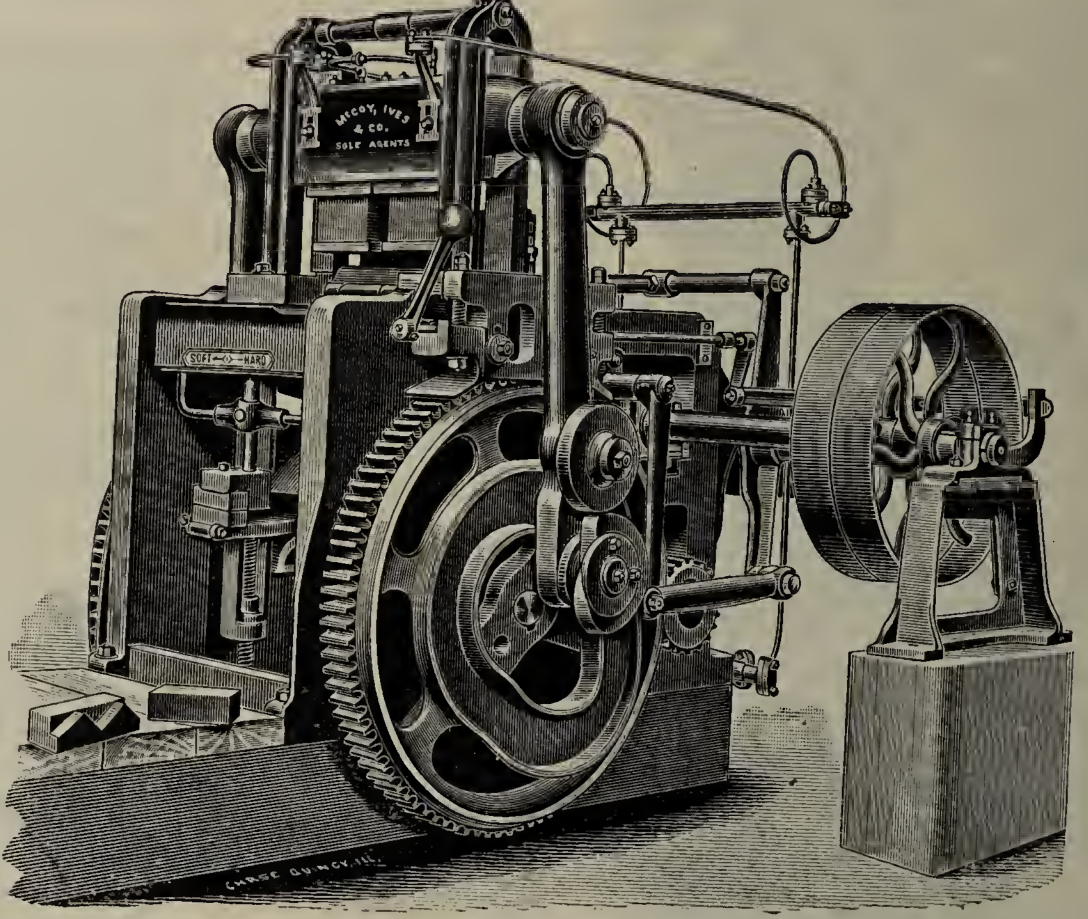

THE BEST ON EARTH.

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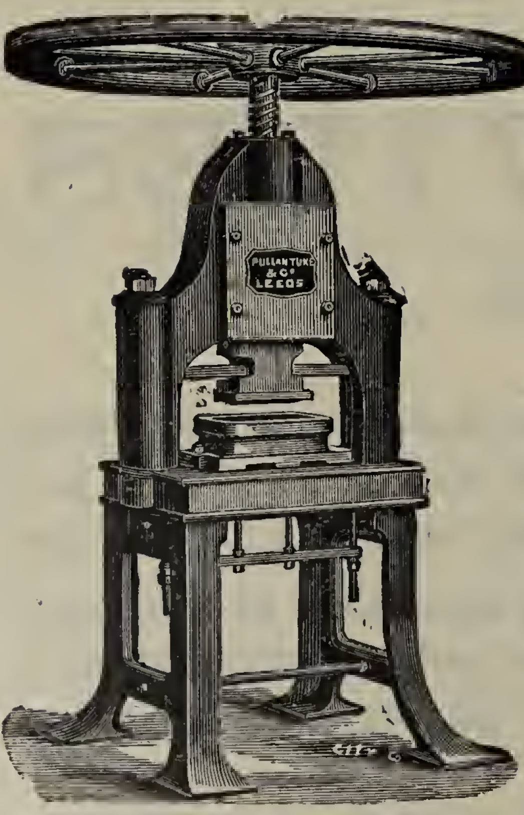
Titley's Patent Screw Press.

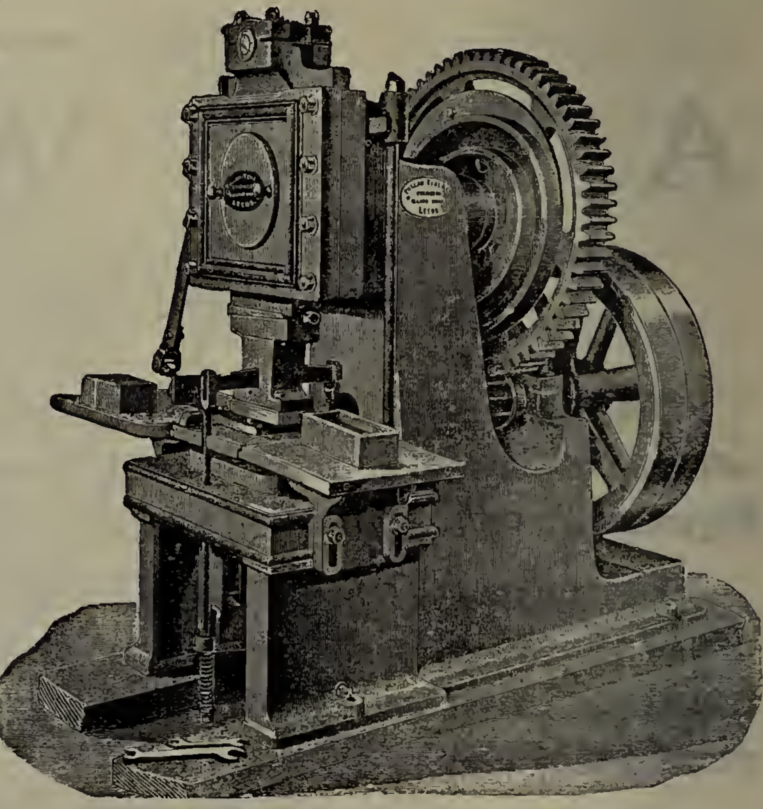


Pullan, Tuke & Gill's Patent Steam Press

WE beg to call the attention of Brick, Tile and Terra Cotta Makers to these two Presses as the *Peers of any press on the market* for superiority of finish in the work produced.

The *Steam Press* is best adapted to large works and will produce the best quality of Front Bricks. Its capacity is 10,000 per day of the finest bricks at the smallest cost for labor. For small works and for all makers of moulded and ornamental bricks, tiles and terra cotta, we recommend the *Screw Press.* It will exert a pressure of 30 tons and is to-day *without a rival* a the *best press on the market.* Its capacity is 3,000 to 4,000 plain brick per day.

Send for circulars giving all information, with testimonials.



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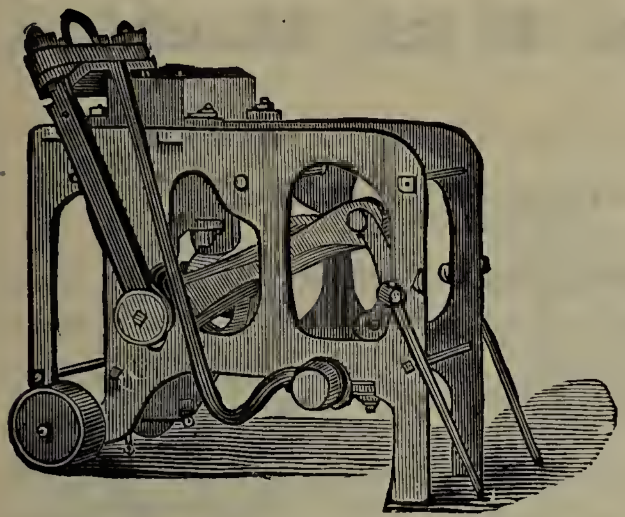
Sole Agent for the United States. **Ironton, Ohio**

(Mention the Clay-Worker.)



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1819 and 1821 Germantown Avenue,
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PHILADELPHIA, PA.

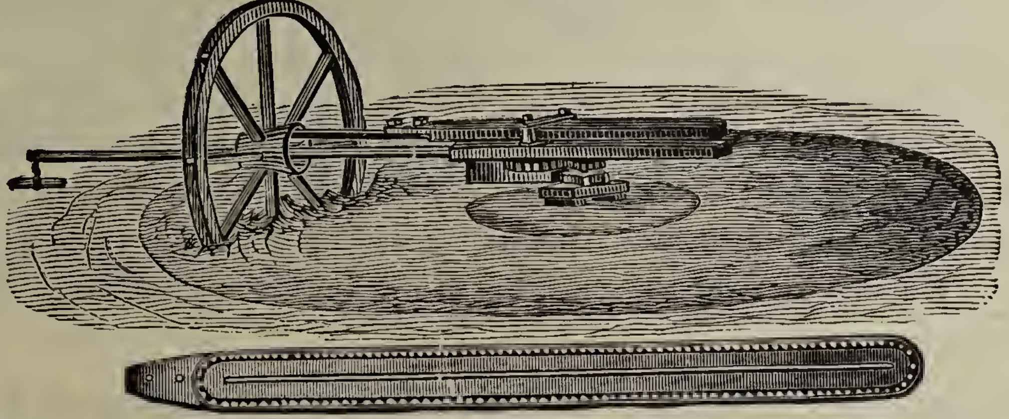
☞Send for Circular and Price-List.

Philadelphia Brick Machine Works

—MANUFACTURER OF—

FIRE AND RED BRICK PRESSES.

Various sizes, from the smallest size up to 24 inches; also, manufacturer of **Clay Mills, Tempering Machinery,** and all kinds of **Brickmakers' Tools.**



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and is fitted up ten per cent. cheaper. ☞Mention THE CLAY WORKER.

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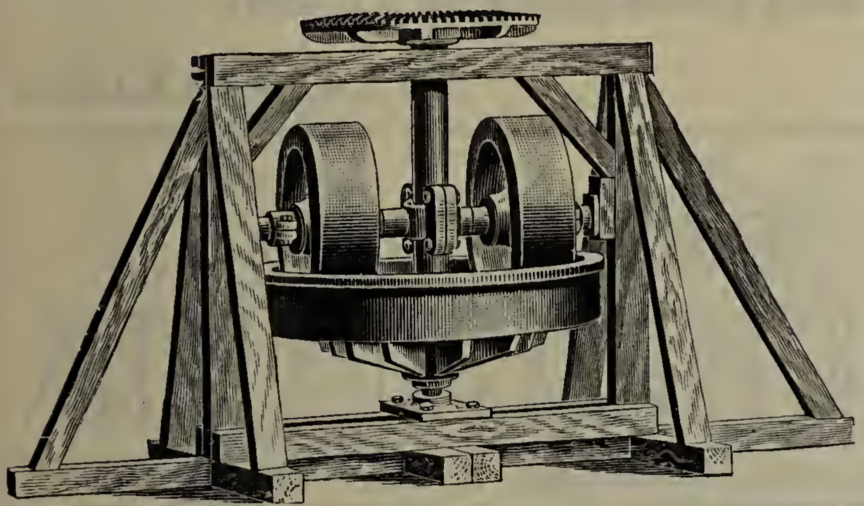
Dry & Wet-Pan Crushers, Chasers, Etc.,



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BRICK, TERRA-COTTA, SEWER PIPE AND FIRE CLAY.

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The best and cheapest machines made for working hard clay, soap stone, grog, etc.

Write for prices and other nformation.

THE FROST ENGINE Co.

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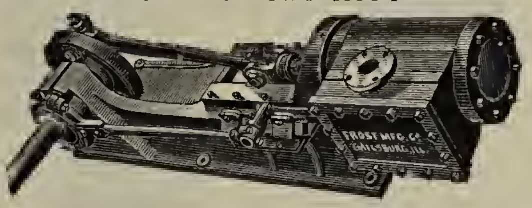
ALL SIZES UP TO 150 H.P.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PULLEYS, SHAFTING, SPROCKETS, BUCKETS, BELTING, SHELLERS, CLEANERS, MILLS, &c.

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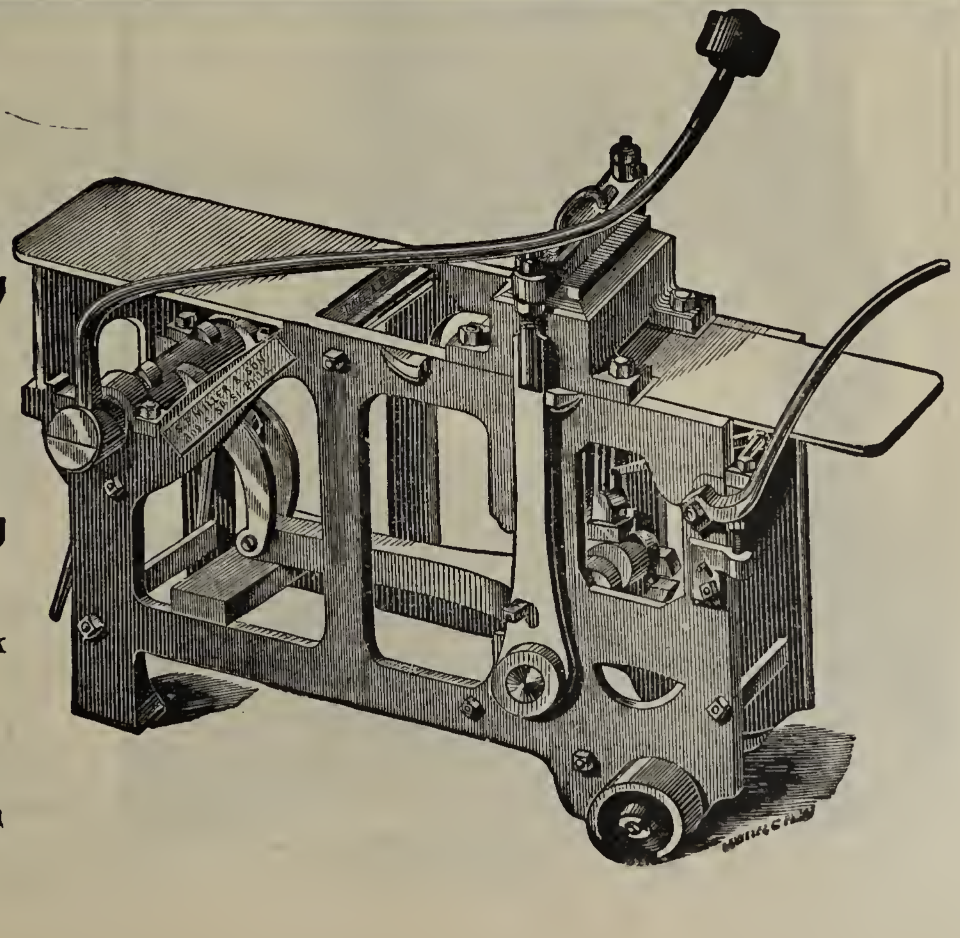
Of five different styles, embodying all the improvements in Hand Brick Presses in use.

Clay Wheels with Reciprocating Rack, Kiln Castings, Brick Moulds, Clay Spades, and the Tools in General Use for Brick Making.

No. 309 SOUTH FIFTH ST., PHILADELPHIA, PA.

S. P. M. & Son refer to Brickmakers generally. ☞ Orders from abroad promptly attended to.



Do You Intend Purchasing a New Brick Machine,

—OR,—

Is the Machine You Are Now Using Not Giving Satisfaction?

If so, it will pay you to investigate the merits of our **Horizontal Stock Brick Machine.** It is the only machine on the market which does not require extra pug mill *to work the clay direct from bank.* The only one which will work the clay so stiff the brick will not pitch in trucking or spread in drying. It has no light, complicated parts underneath where the sand and dirt can get on them. Every part is out where they can be kept clean and oiled. It is the strongest and most durable machine ever made. Our prices are lower than those of any Vertical Machine and Pug Mill. All machines are guaranteed to give satisfaction and erected subject to trial. We make a specialty of erecting complete plants. It will pay you to write us for prices and terms before purchasing elsewhere. We also manufacture full line of brickyard supplies, Pug Mills, Disintegrators, Mould Sanders, Trucks and Barrows.

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A. Potts & Co., Gentlemen—We enclose balance due on Horizontal Brick Machine. We are very much pleased with machine; it has done all you guaranteed. The brick made are perfect. Capacity only limited to our facilities for handling. We can recommend it to anyone wishing a successful brick machine. Wishing you success we are Yours Truly, F. N. WRIGHT & CO.

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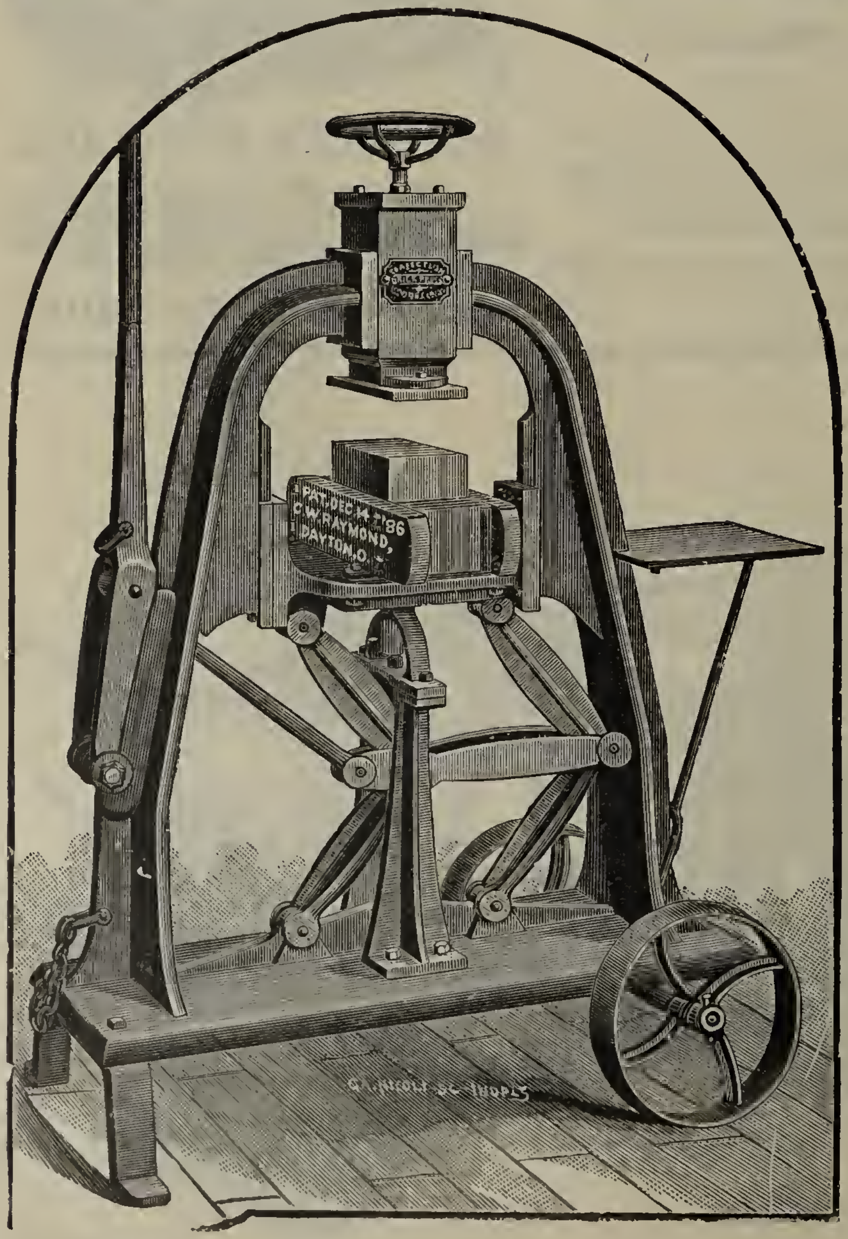
Indianapolis,

[Mention the Clay-Worker.] **Indiana.**



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(No. 1 for Red Brick. No. 2 for Fire Brick.)

SIMPLE AND POWERFUL.

Its whole action is derived from a short, easy, but powerful movement of one lever. A PERFECT Press which turns out perfect work.

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RAYMOND'S

Wrought Iron Tempering Wheel,

OFF-BEARING TRUCKS, BRICK AND SPRING BARROWS, MOULDS, KILN DOORS, ETC.

Send for Illustrated Catalogue.

ADDRESS

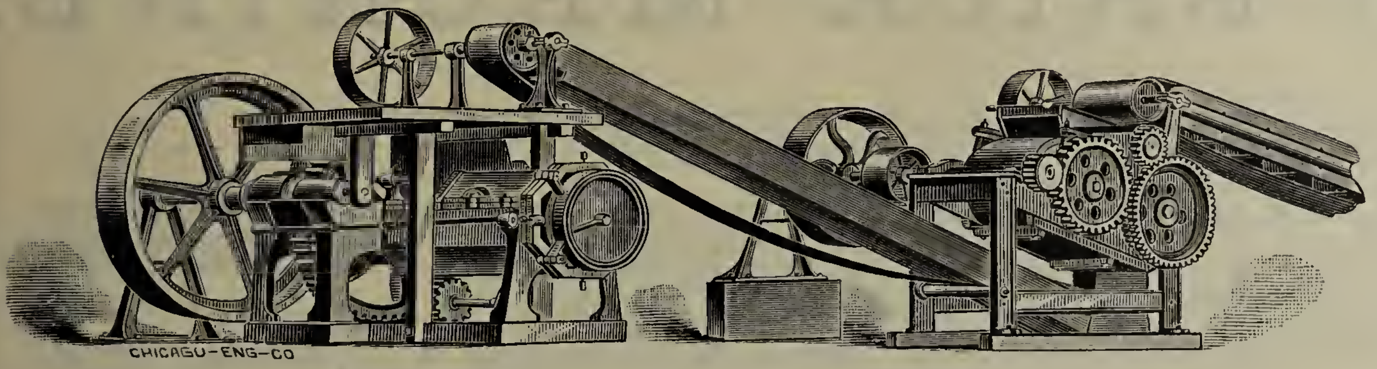
C. W. RAYMOND & CO.,

[Mention the Clay-Worker.] **DAYTON, OHIO.**

Adrian Brick and Tile Machine Co., Adrian, Mich.,

—MANUFACTURERS OF—

Brick and Tile Machinery,



Clay Crushers,
Engines
and Boilers.

Also Daso's Builders' and Contractors' Elevators. Steam Fittings and Iron and Brass Castings Furnished to Order.

The working qualities of our machinery at its present state of development as estimated by one of the prominent Brick Manufacturing Companies of Kansas City, are stated in the following reply to a letter of inquiry addressed to them:

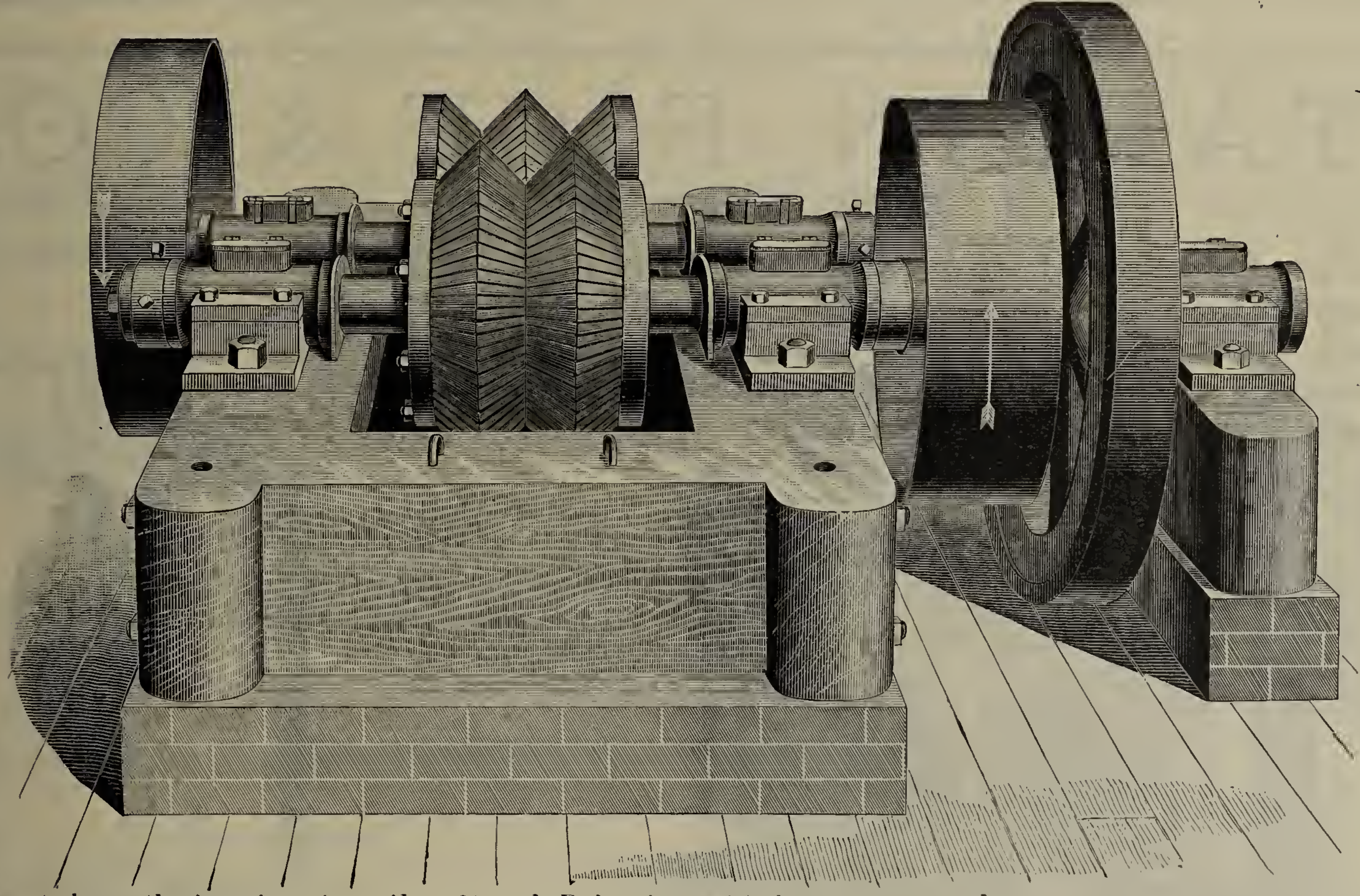
Kansas City, Mo., August 21, 1888.

JOHN GIBSON, Esq., Monticello, Iowa:

Dear Sir—In answer to your favor of the 16th will say, that we do not think there is any room for improvement in the Adrian Brick and Tile Machine Co's No. 4 Cut-off Table, as it cuts the brick as near perfect as possible, without tearing the edges; thus leaving the ends of the brick as perfect as the face. We are also using the new dies on both our machines, and are well pleased with them, as they are 100 per cent. better than the old style and turn out a perfect column of clay without warping or twisting. We have two No. 3 McKenzie machines and they are doing excellent work for us and we averaged during July, 26,800 brick, each, per day. In conclusion we will say that both the new tables and the new dies are so incomparably superior to the old ones that it gives us much pleasure to recommend them.

Very truly yours, SEDDON & EDWARDS BRICK CO.

The NEWELL LATEST IMPROVED CLAY PULVERIZER IS THE BEST.



This cut shows the interior of our New 26-inch Pulverizer with hopper removed.

Send for illustrated circular and price-list.

NEWELL UNIVERSAL MILL CO.,

10 Barclay Street, New York.

THE NEW IMPROVED
CHIEF BRICK MACHINE.

Patented Jan. 1, 1884, *April* 2, 1884, *and the new improvements of* 1887 *and* 1889.

Has taken the lead and stands at the head of all Brick Machines, and is now in operation in every State and Territory in the Union.

In its original construction it was exhibited and operated at the great Southern Exposition at Louisville, Ky.; also at St. Louis, Mo.; Kansas City, Mo.; Indianapolis, Ind.; Columbus, O.; Cincinnati, O.; Chicago, Ill.; and at each and all places where premiums were awarded the CHIEF carried off the first prize medal over all competitors.

And with the late new improvements added the CHIEF stands in perfection, at the head of human inventions.

The NEW IMPROVED CHIEF is wonderful in operation, is all steel and iron, and of the greatest strength and durability, is easily operated, and with two horses or a small engine makes 60 to 100 perfect bricks per minute. Grinds, tempers and at the same time moulds into brick any clay. Stones in clay cannot break it, nor interfere with its free operation. It is easily transported, and changed from horse to steam power. It fills the moulds evenly and well until the machine is empty of clay, pressing each brick equally and solid, so all will shrink alike. The pressure can quickly be changed while the machine is running to suit the consistency of the clay. All shafts are of steel; main shaft runs in three boxes or bearings all outside of the machine into which mud or sand cannot penetrate. The wear can at all times be taken up so as to prevent leakage. The clay in the press box is under full control of the plunger, which is direct and positive, and prevents the mud from floating back into the mud drum; this feature is not found in any other mud machine.

Bricks made by the NEW IMPROVED CHIEF, are solid and perfect, and have sharp edges and corners, and do not crumble in burning.

The NEW IMPROVED CHIEF is equally suitable either for small or large yards, the best of bricks are made by it at the least labor and expense, all parts are easy of access and the bearings can be oiled from the outside. All ordinary sizes of brick as well as ornamental brick can be made on the NEW IMPROVED CHIEF and it is especially adapted to making fire brick of any shape.

The NEW IMPROVED CHIEF is sold on its merits, and warranted to be all that is claimed for it.

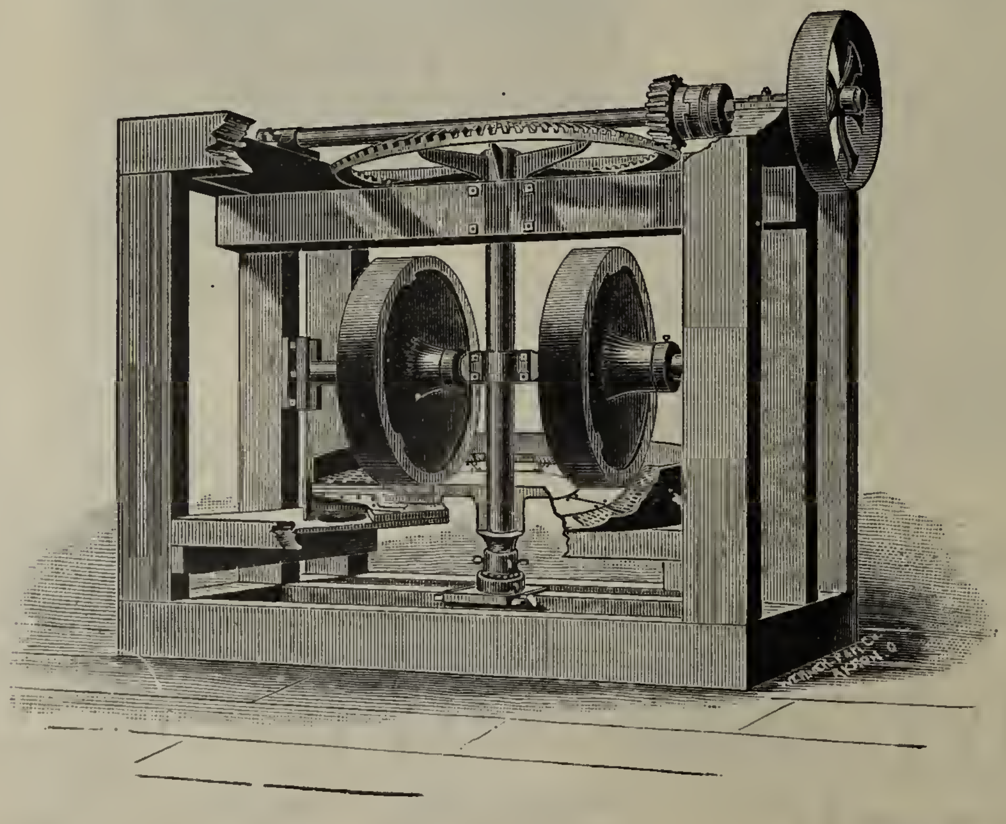
We will send Circulars and Testimonials of the NEW IMPROVED CHIEF BRICK MACHINE, New Departure Tile Machine, Engines, Etc., Etc., free to any address on application. Address

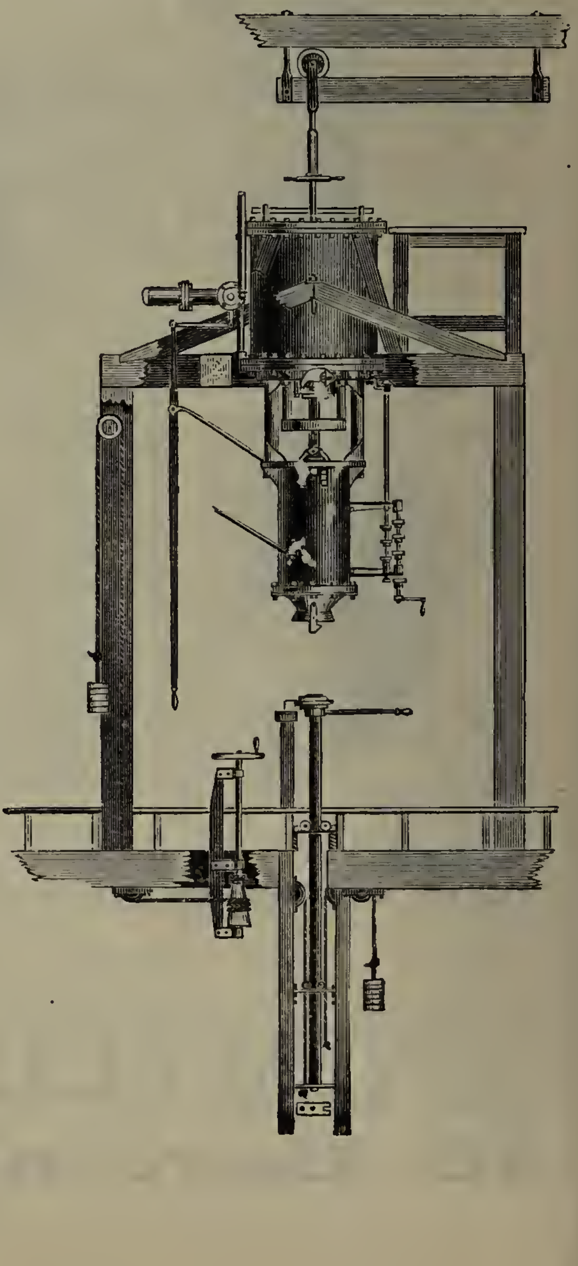
Anderson Foundry & Machine Works,

Mention the Clay-Worker. **Anderson, Indiana.**

TAPLIN, RICE & CO.,
AKRON, O.

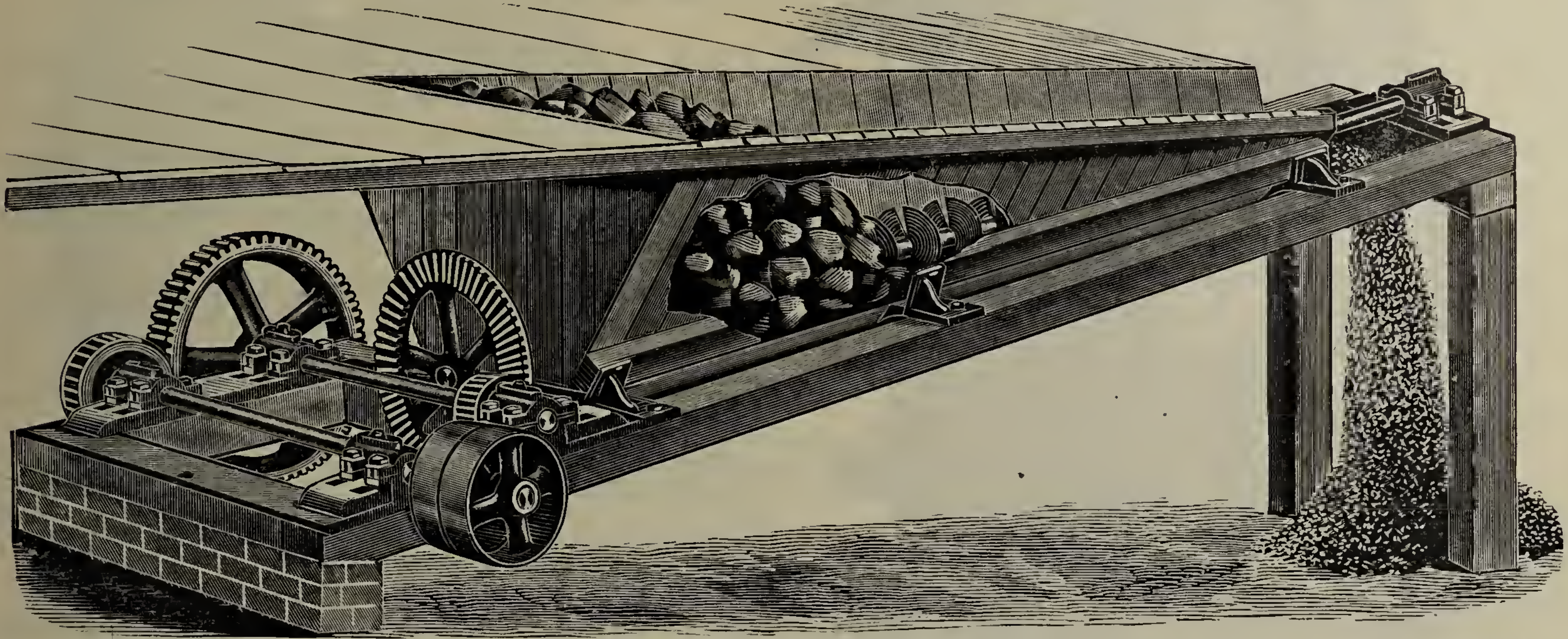
Manufacturers of Improved Clay Working Machinery of all kinds, such as Clay Mills, Dry and Wet Pans, the Barber Steam Sewer Pipe Press, Dies, Clay Blockers, Potters' Wheels and machinery of every description. Write for circulars.





Emen's Patent Perfection Clay Granulator and Feeder.

SOLD SUBJECT TO TRIAL AND APPROVAL.



Saves time and labor and produces better ware; simple in construction; rapid and accurate in operation Every brick, tile and sewer pipe manufacturer should investigate the merits of this machine.

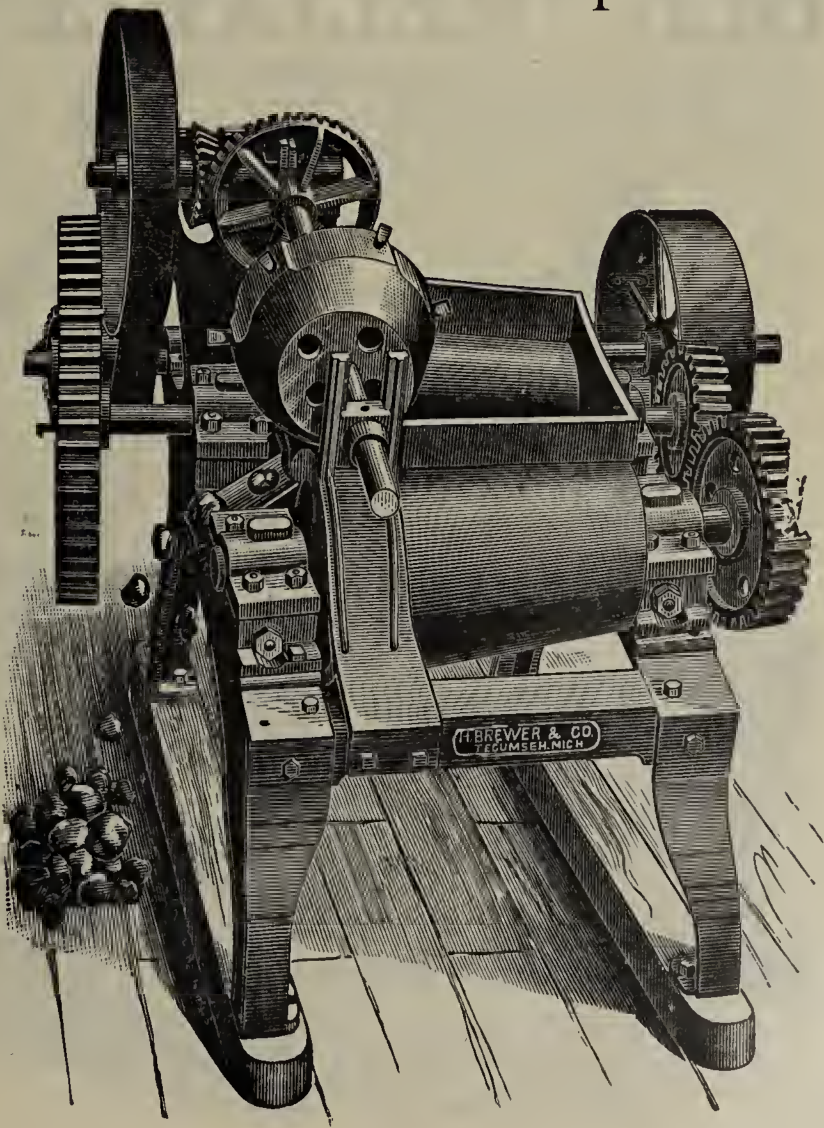
During the past season it was introduced in several of the leading Chicago brickyards and is now at work giving entire satisfaction. Write for descriptive circulars.

Chambers Brothers Company, of Philadelphia, Pa., are licensed to manufacture and sell these machines.

EMENS AND COLE

[Mention Clay-Worker.] HOLTON, (MUSKEGON CO.) MICH

H. Brewer & Co's. Clay Crusher and Stone Separator.


H. BREWER & CO.
TECUMSEH, MICH.

The prominent feature in this Crusher is the combination of two smooth, tapering crushing rolls, running at different speeds, in connection with an adjustable transverse roll which is of irregular form and provided with teeth or spurs, whereby the clay is rapidly broken up and crushed, and the stones separated therefrom.

TESTIMONIALS.

Saunemin, Ills., May 18th, 1888.

H. Brewer & Co., Gentlemen—Your Crusher works to a charm and we are very highly pleased with it. It runs one-half easier than any other Crusher we have had.

Yours Truly,
SAUNEMIN BRICK AND TILE CO.

Budd, Ills., May 3d, 1888.

H. Brewer & Co., Dear Sirs—The Crusher and Elevator work to my entire satisfaction. I feel confident I would be $2,000 ahead, to-day, had I put in your Machine and Crusher at the start.

Yours Truly,
HENRY SIEDENTOP.

Monroe, Iowa, May 15th, 1888.

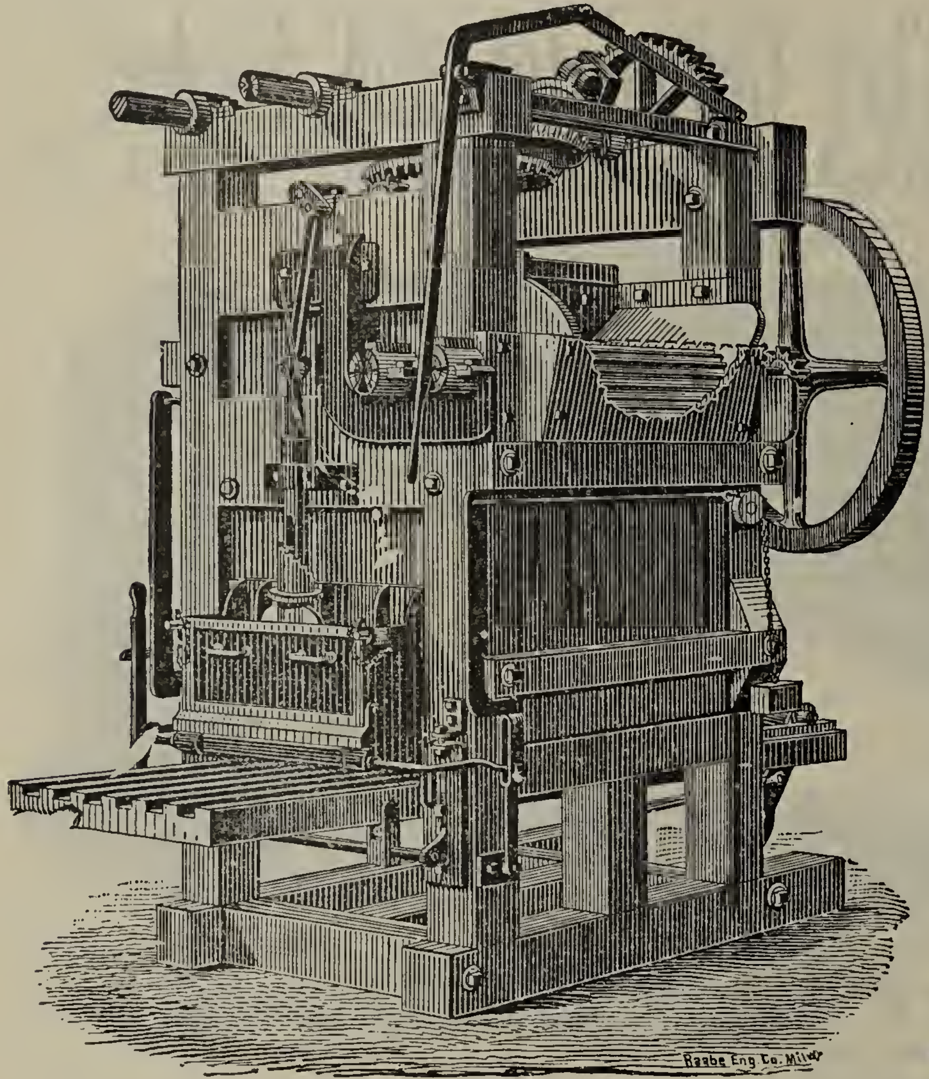
H. Brewer & Co., Gentlemen—The Crusher is giving good satisfaction and I think will do all that is claimed for it.

Yours,
T. P. BURCHINAL.

☞ Do not fail to obtain our prices on Tile Machines, Brick Machines, Pug Mills, Clay Crushers, etc. For illustrated Catalogues and Price List, address

H. BREWER & CO.,

(Mention Clay-Worker.) **Tecumseh, Mich.**



GURNEY
BRICK MACHINE WORKS,

MILWAUKEE, WISCONSIN,

Manufacturers of

THE GURNEY BRICK MACHINE

—Having Crushers Inside of Pug Mill.—

THIS is the only Machine in use which has the *combination of Crushers, Mixing and Moulding Apparatus* in a single machine. The arrangement is covered by patent issued October 6, 1885.

This machine will work any clay, however hard and lumpy, with no preparation before soaking in the usual way. The Crushers will take the clay through as fast as the machine will turn out the brick, *doing entirely away with lumps*, which brickmakers know have been much in the way of making good brick, and also have caused great loss by breakage.

The Machine will turn out four thousand, or more, good, smooth, square brick an hour. With proper moulding sand THE BRICK FROM THIS MACHINE, *made from any clay*, WILL SLIP EASILY. The Machine has been thoroughly tried in different parts of the country.

Also First-Class STEAM and HORSE-POWER MACHINES of same pattern, without Crushers.

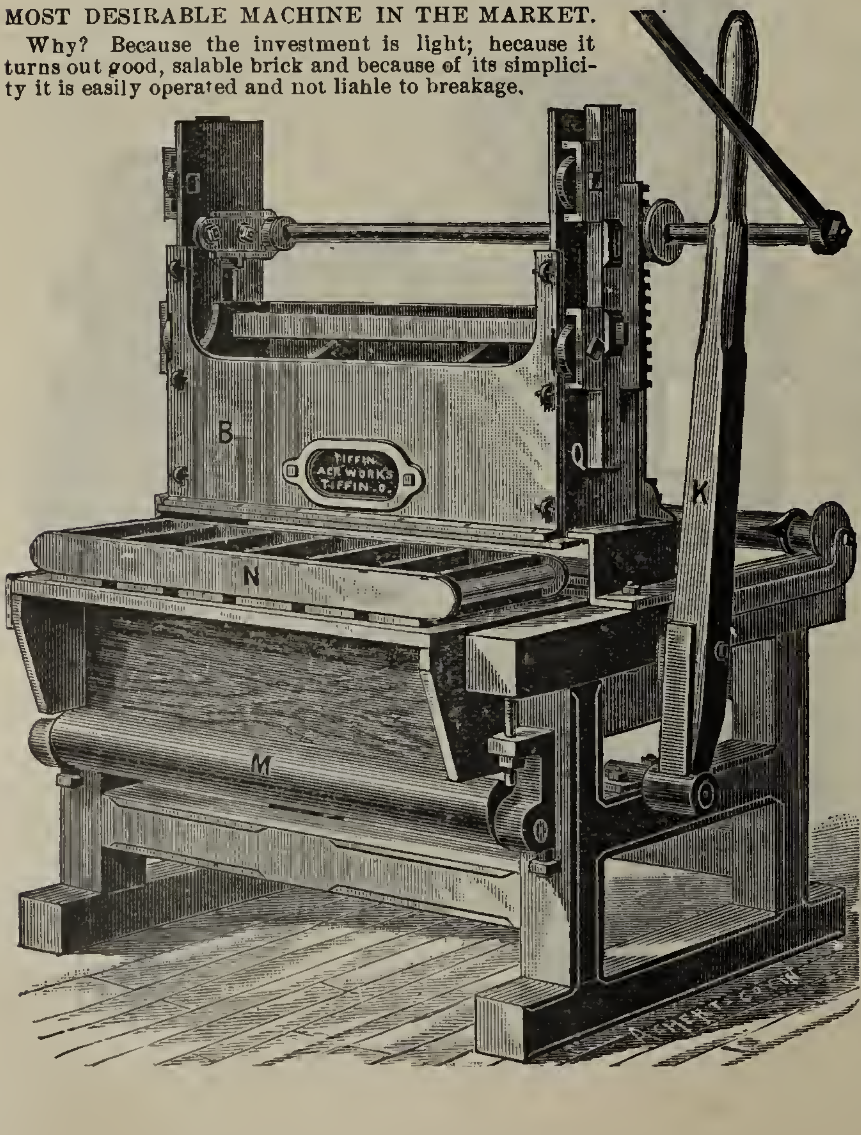
For further information and Illustrated Catalogue address—

T. C. GURNEY,
100 Wisconsin St., MILWAUKEE, WIS.

THE LATEST IMPROVED
OLD "RELIABLE" BRICK MACHINE.

MOST DESIRABLE MACHINE IN THE MARKET.

Why? Because the investment is light; because it turns out good, salable brick and because of its simplicity it is easily operated and not liable to breakage.


B
Q
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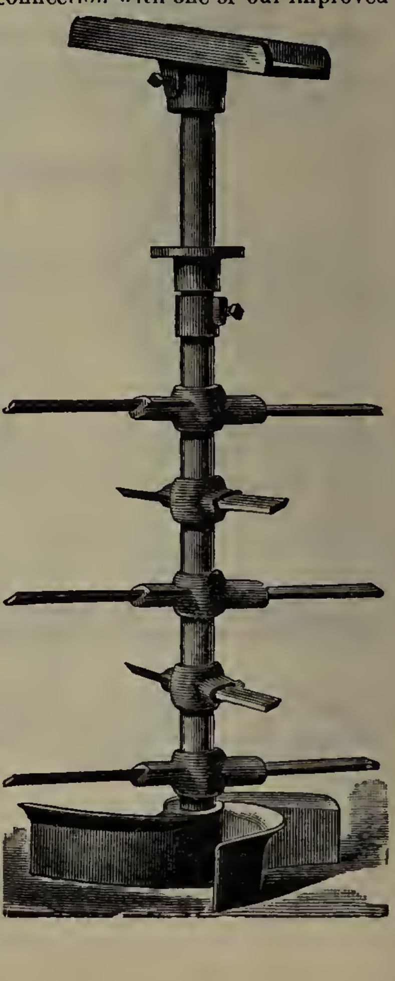
M
TIFFIN AGR WORKS TIFFIN, O.

The Best, Cheapest and Most Durable.

We have no hesitancy in claiming that the "OLD RELIABLE" when properly handled will easily be capable of producing

10,000 to 15,000 Good Square Brick per Day.

To get it to its full capacity it should be used in connection with one of our improved Pug Mills or at least have one of our Wrought Iron Pug Mill Shafts, with Mud Wing. The labor of the horse is considerably lessened by the use of the wrought iron shaft, and the effect and operation of the Mud Wing is to cause the clay to be forced out regularly and steadily into the moulds, thus fully supplying the moulds and filling out the corners making the very best quality of brick and at the same time greatly increasing the capacity of the machine.



ITS RECORD CANNOT BE BEAT.

Thousands of the "Old Reliable" are in use and rendering full and complete satisfaction to brick makers in all parts of the country. An experience of twenty years gives them unqualifiedly the highest degree of merit. The practical brickmakers say of them that they are the easiest working and best hand power machine in the market and we have now to announce that we have so improved it as ot render it still easier to operate and we feel that we are warranted in the belief that it is without an equal.

Figure on it and you will find that it will not pay you to make brick by hand, nor will it pay you to buy the high-priced machines with heavy investment and liability to breakage and consequent expensive repairs when you can buy the

Improved "Old Reliable" for $40.

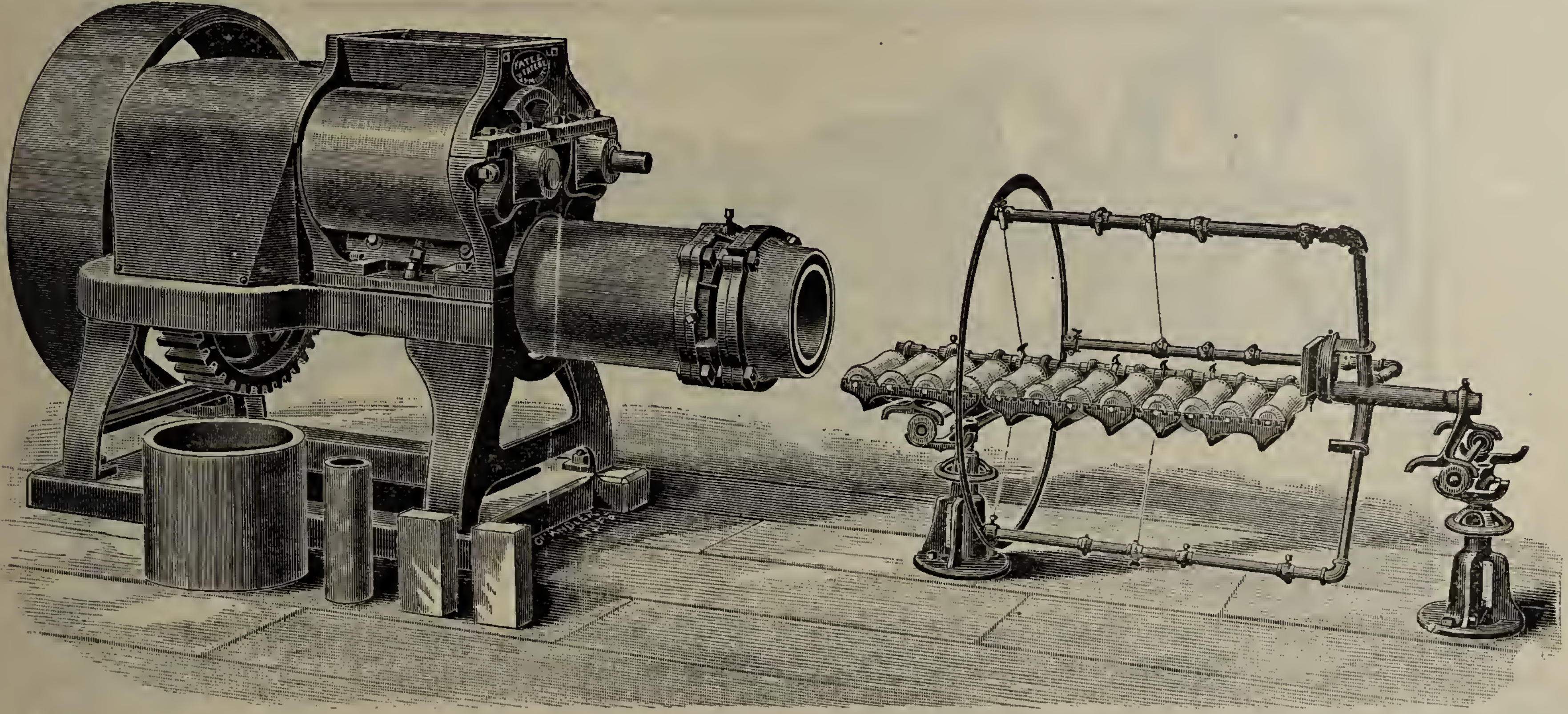
A simple, strong, efficient machine, tried and proved by years of use and endorsed by hundreds of practical brickmakers as being THE BEST.

☞ Send for descriptive catalogue giving prices of BRICK MACHINES, PUG MILLS, MOULDS, WHEELBARROWS, ETC.

TIFFIN ∴ AGRICULTURAL ∴ WORKS,
TIFFIN, - - OHIO.

THE OHIO BRICK AND TILE MACHINE.

Unequalled for Rapid and Perfect Work!

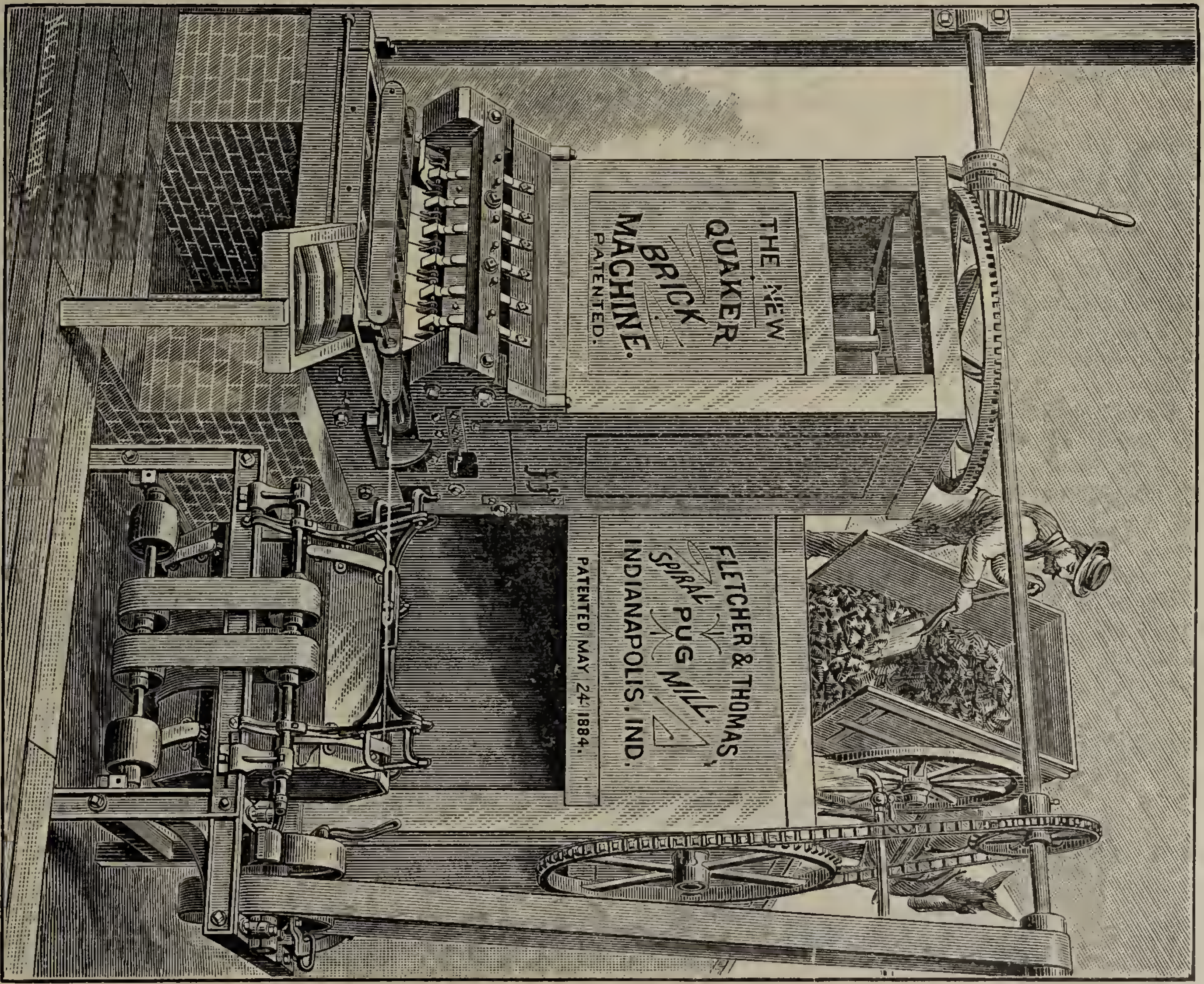


Most simple, durable and convenient in use. Side or end cut brick. Tile up to 15 inches. We have the latest and most approved Cutting Tables. Satisfaction guaranteed. Factory outfits furnished. Address

FATE & FREESE,

Send for particulars.

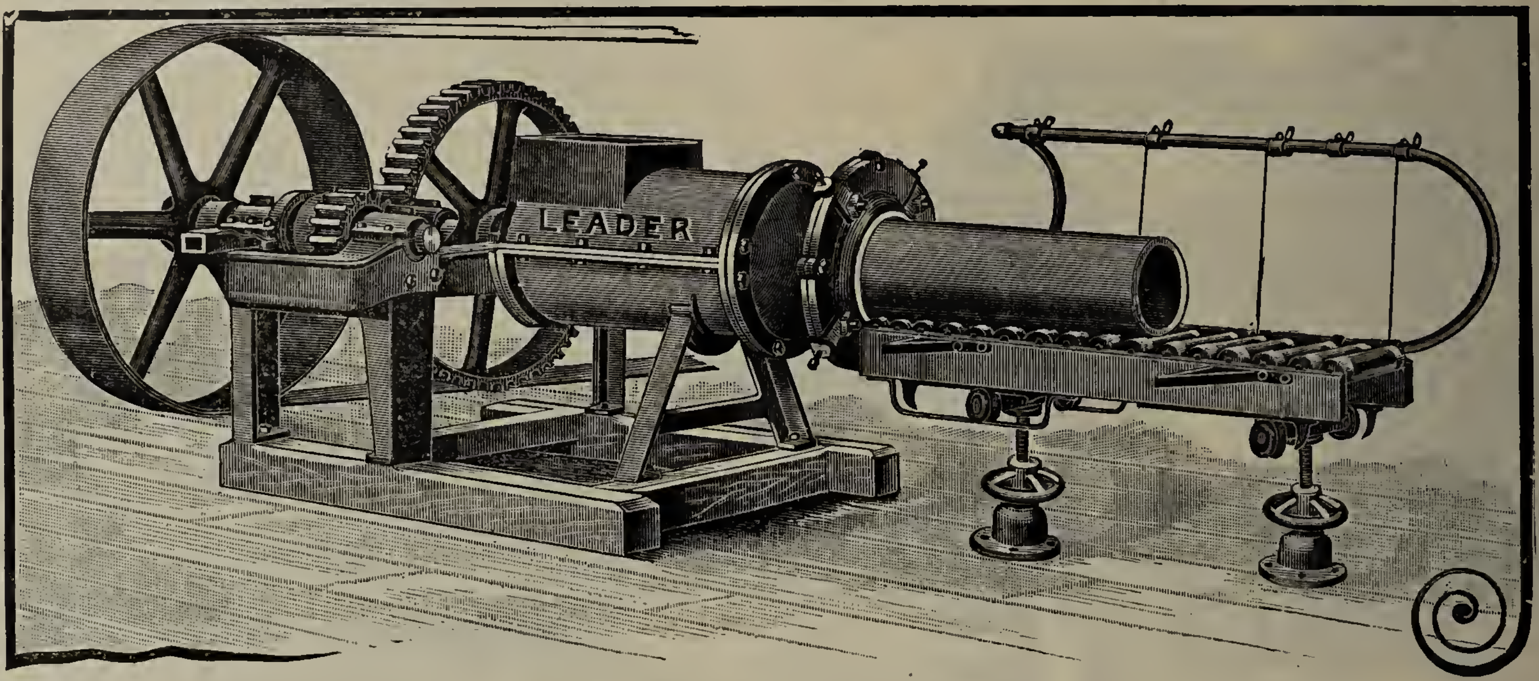
PLYMOUTH, OHIO.


THE NEW QUAKER BRICK MACHINE. PATENTED.
FLETCHER & THOMAS, SPIRAL PUG MILL INDIANAPOLIS, IND.
PATENTED MAY 24, 1884.

This outfit will make the largest number of the very best of Stiff Moulded Bricks at Least Cost of anything in the market. For further particulars, address

BENNETT BROS. & CO., Wellington, Lorain Co., Ohio.

THE LEADER BRICK AND TILE MACHINE.



We manufacture the very latest and best designs of Tile Machines, Brick Machines, Clay Crushers, Elevators, and Dump Cars for handling clay by steam. Design special clay-working machinery to order. Have a large stock of the best cutting wire. Correspondence solicited.

BROWN & HARROP MFG. CO.,

Geo. S. Pollock, Agent, Sullivan, Ind **PORTLAND, IND.**

STEDMAN'S IMPROVED
Disintegrator and Pulverizer.

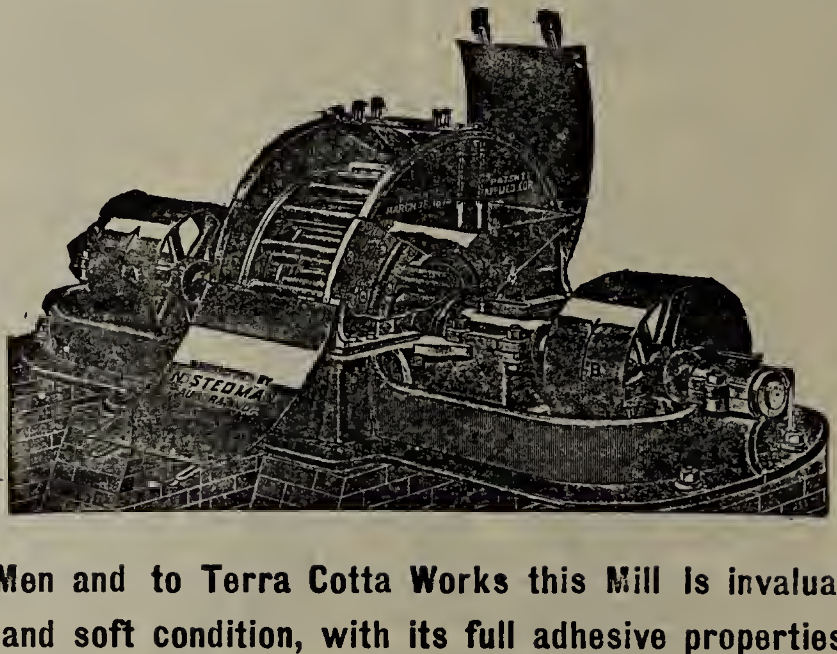
This mill will disintegrate or pulverize the following materials:

Clays of all kinds, Shale and Slate direct from the bank, for Brick and Tile.

Fire Clay and Sand Stone Rock—for Cement and Fire Brick.

Iron Ores of various kinds, Guano, Phosphates, Bones—green, dry steamed, Tankage, Bone-Ash, Salt Cake, Soda, Cracklings, Oyster Shells, Animal Matter in almost all conditions, Old Fire Brick and Tiles.

Old Pottery Ware, Plastic Clay, Asbestos, and in fact almost any material that can be disintegrated.



A good Disintegrator and Pulverizer is a long felt want in many branches of business. This Mill is an improvement over any yet made and is the result of practical experience.

This Mill is made in three sizes: 34, 40 and 48 inches. The capacity for clay is as follows:

34 inch Mill will pulverize for from 15,000 to 25,000 brick per day.

40 inch Mill will pulverize for from 20,000 to 35,000 brick per day.

48 inch Mill will pulverize for from 75,000 to 100,000 brick per day.

To Brick, Tile and Pottery Men and to Terra Cotta Works this Mill is invaluable. It reduces the clay to a fine, light and soft condition, with its full adhesive properties retained.

For Prices and any other Information, Address

Stedman's Foundry and Machine Works,

PROTECTED BY PATENTS. **AURORA, IND.**

[Mention the Clay Worker.]

Special Announcement!

In order that we may be able to better represent our extensive line of

CLAY-WORKING MACHINERY,

We have purchased from the Clay-Worker the exclusive privilege of

Colored Page Advertisements

We shall from time to time illustrate new and improved machinery which we are constantly bringing out, and shall change our advertisement with each issue, so if you wish to be posted as to the latest and best to be had in the way of Clay-Working Machinery,

DON'T FAIL TO CONSULT THE COLORED PAGE.

Our line of machinery is the largest and most complete manufactured, and we are fully prepared to furnish Complete Outfits of any desired capacity.

We Manufacture:

Stiff Clay Brick Machines, Soft Mud Brick Machines, Tile Machines, steam & h.p.,
Soft Mud Pug Mills, Clay Crushers and Stone Separators, Stiff Clay Pug Mills,
Granulators, Elevators and Conveyors, Kiln Castings and Yard Supplies,
Iron Dry Cars, Cast Pulleys, Line Shafting, Hangers, Couplings, Set Collars, etc.

WE HANDLE ENGINES AND BOILERS.

Our Patented Steam Dryer is the Best.

COME AND SEE US

J. W. Penfield & Son,

Read the other side.

WILLOUGHBY, OHIO, U. S. A.

COMPLETE OUTFITS FOR MAKING
Common Brick, Face & Ornamental Brick,
STREET PAVING BRICK,
OF ANY CAPACITY FROM 10,000 TO 80,000 PER DAY.

OUR NO. 20 BRICK MACHINE.

During the past season we placed on the market a mammoth Brick Machine, which we call the No. 20, having a capacity of 80,000 brick per 10 hours and weighing about 25,000 lbs. We also constructed a large Four Roll Crusher and a Pug Mill for use in connection with the No. 20 Machine weighing respectively about 27,000 and and 12,000 lbs. each. These machines constitute without doubt the Strongest, Best and Most Serviceable Outfit of Brick Machinery manufactured. Any one desiring large capacity or an outfit of great strength will do well to investigate the merits of this group of machines.

Improved Dies

We have invented and adapted to our machines several new forms of dies with which we can work many kinds of clay which heretofore die working machines have been unable to handle with success.

An Offer.

Our complete and handsomely illustrated catalogue of Fancy and Ornamental Brick, Mouldings, Belting Courses, Etc., will be mailed to any one applying for the same.

Steam Dryer.

Our patent Steam Dryer has proven a complete success.

We have complete plans and specifications for dryers of any capacity desired. Parties wishing to use artificial drying should write for particulars of our invention in this line. We also make a strong, durable, Iron Dry Car. Prices and photograph will be furnished on application.

STREET PAVING BRICK:

The merits of brick for paving purposes are becoming more generally demonstrated and known and in consequence the demand for them is greatly increasing. Paving brick, we believe, have come to stay and it behooves all wide awake brickmakers throughout the country to give attension to this branch of the industry. We have furnished a large number of outfits for manufacturing paving brick solely, and they have given excellent results from the fact that the end cut brick made on the Penfield Machines are found to be stronger and superior in many ways to brick made by other processes or machines.

Correspondence solicited. Address the manufacturers—

J. W. PENFIELD & SON,

Read the other side.

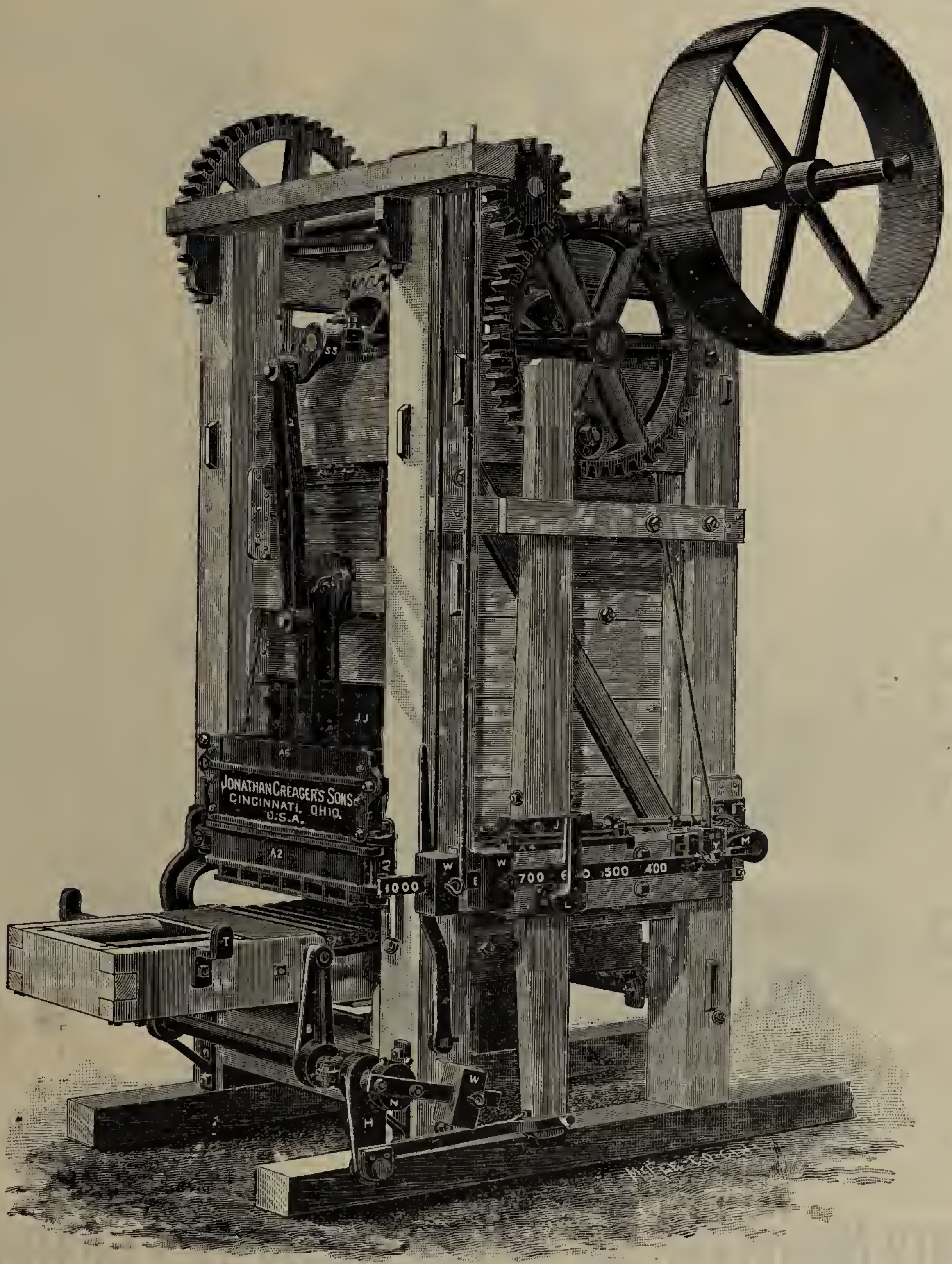
WILLOUGHBY, OHIO, U. S. A.

THE

IMPROVED GRAND AUTOMATIC

FOR 1889.

ALMOST every Brick Maker has heard more or less of this famous **Brick Machine** that has in the past two seasons been the salvation of many " confiding " manufacturers, and is justly acknowledged to be the **Strongest, Lightest Running** and **most convenient** machine of its class in the world, has replaced dozens of inferior machines, which were doubtless represented to be AS GOOD as the **"Automatic."** Many of the craft are led to purchase machinery through the influence of Patent Medicine testimonials, but when the stiff, square brick were wanted, the machine " was n't thar." We have replaced and are now offered—in trade—several of the **identical machines** now advertised in this paper. You can not afford to let these plain facts go by without a thorough investigation.



Your Desire to secure the Best advises it, your Pocket demands it, your Money is better than Old Stock

With which to purchase a reliable and successful

GRAND AUTOMATIC.

All information promptly furnished, and our new catalogue mailed on application to

JONATHAN CREAGER'S SONS,
CINCINNATI, OHIO.

Complete Outfits for Making Brick from Bank to Kiln.

TO THE FRONT AS USUAL

We have no "exclusive" right to tell our story on tinted paper, but we have "exclusively" the most successful and complete line of

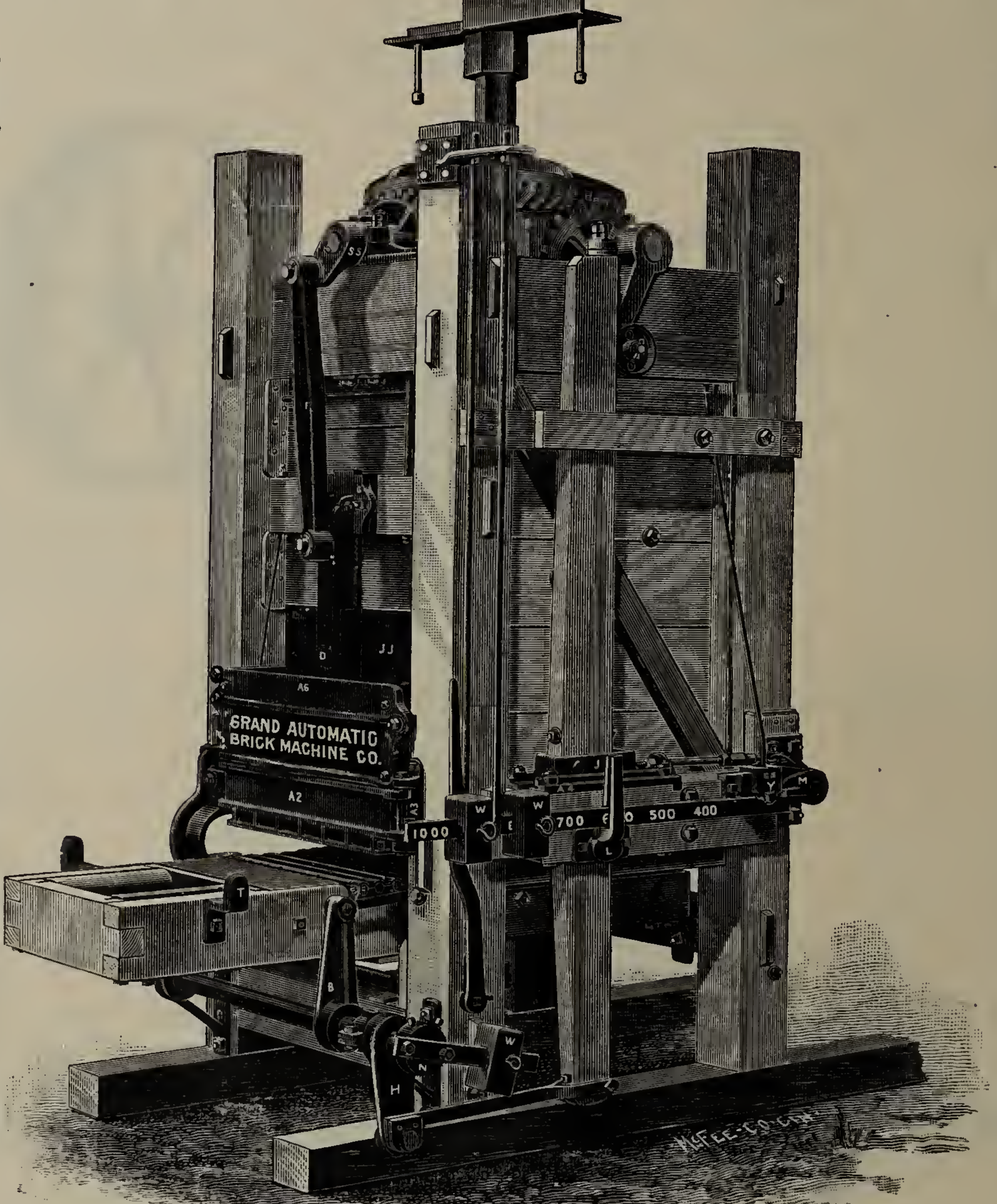
Brick Machinery

In this or any other country.

Every Brick Machine will make brick of some kind, and every machine is doubtless represented to be **as good as the "Automatic,"** but **THEY ARE NOT.** Do not be caught napping!

Our Horizontal Pug Mills,

particularly the double-geared—are also acknowledged to be the best by all who have used them. Our **Clay Disintegrators,** that take the clay from any bank, wet or dry, and without choking, places the clay in excellent condition and runs very light. Our complete yard outfit for any capacity—without soak-pits, carts or wheelers — will put brick in kiln under $1.50 per 1,000, according to location.


GRAND AUTOMATIC BRICK MACHINE CO.
1000
700
500
400
McFEE-CO-CIN.

OUR BRICK MACHINE FOR TWO HORSES.

Our Prices are Moderate, Our Terms Liberal and Guarantee Positive

It always pays to buy a RELIABLE machine in the start. Write us for Interesting Information and new descriptive catalogue that may give you a pointer.

The Grand Automatic Brick Machine Co.,

CINCINNATI, OHIO.

St. Louis Iron and Machine Works, Iron Founders and Builders of Heavy Machinery.

ESTABLISHED 1854.
INCORPORATED 1875.

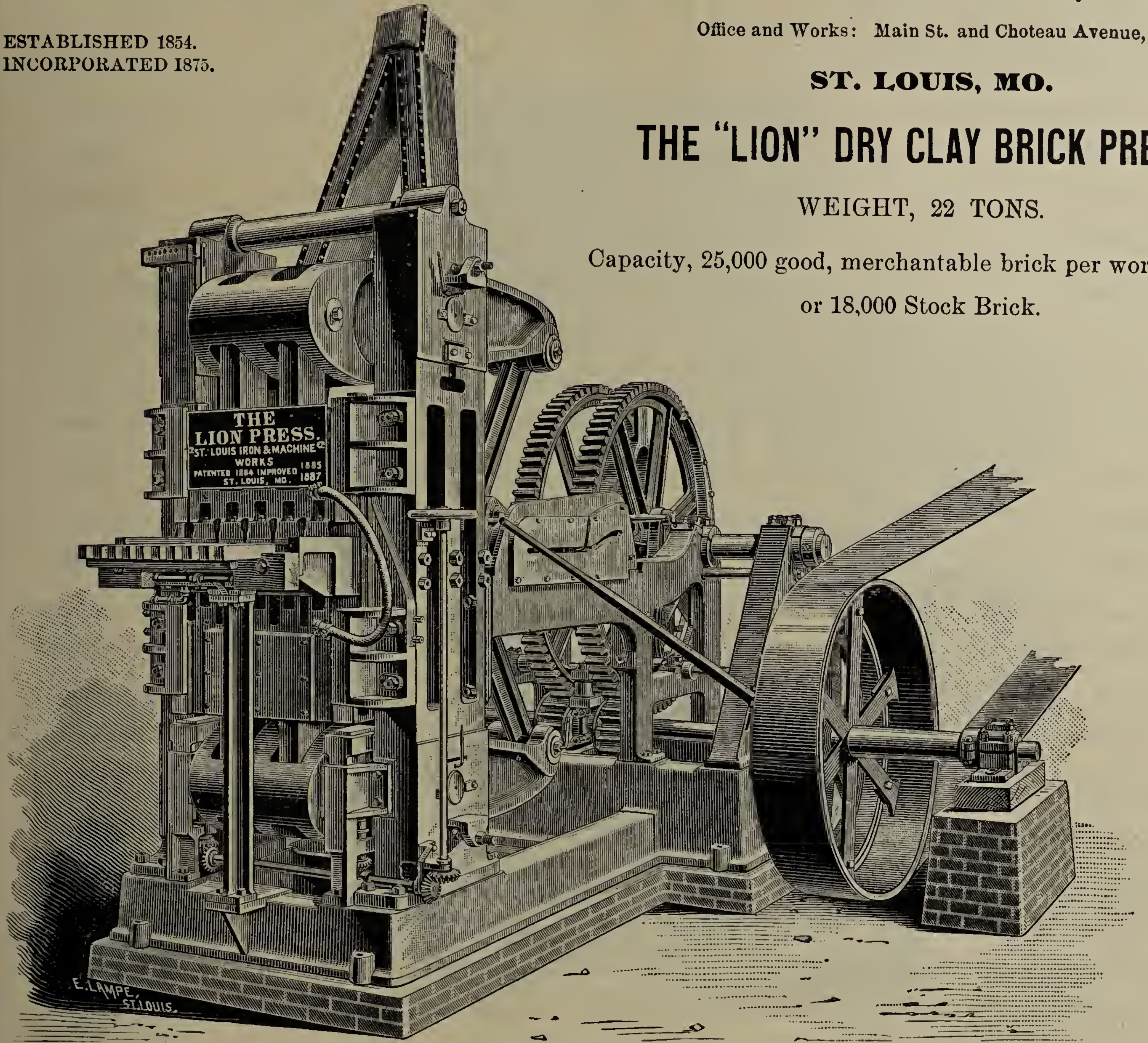
Office and Works: Main St. and Choteau Avenue,

ST. LOUIS, MO.

THE "LION" DRY CLAY BRICK PRESS.

WEIGHT, 22 TONS.

Capacity, 25,000 good, merchantable brick per working day, or 18,000 Stock Brick.


THE LION PRESS.
ST. LOUIS IRON & MACHINE WORKS
PATENTED 1884 IMPROVED 1885 1887
ST. LOUIS, MO.
E. LAMPE, ST. LOUIS.

We claim the following essential features and advantages for our Machine:

1. The main feature of this machine is its great strength, power and durability. The pressure on each brick being 40 tons, and the working parts are so strongly constructed that there is no spring or give under this working strain. 2. The great simplicity and openness of framing and construction, so that every part of the machine is is easily accessible for inspection, lubrication and adjustment, thereby reducing the necessary repairs, incidental to every Brick Press, to a minimum. 3. Pressing 5 bricks at each revolution of Machine, keeps the regular force of off-bearers and setters fully employed, which a 4 Brick Machine cannot do. 4. The adjustment of machine from common to stock brick and vice-versa, can be made in a few minutes' time.

Besides the Press, we manufacture and furnish a complete set of clay preparing Machinery, Elevators, Mixers, and Rollers; also Engines and Boilers complete. We also build different kinds of Steamboat Machinery and Steam Boilers, Corliss Engines, Cotton Compresses, Water Work Plants, Coal and Mineral Mining Machinery, Bridge Work, Hoisting Travelers, Cranes and Elevaters; also general and large castings and Machinery. Any further information cheerfully given.

TESTIMONIALS.

St. Louis Iron and Machine Works, St. Louis, Mo. KANSAS CITY, MO., September 28, 1888.

GENTS: The two "Lion" Presses I bought from you about two years ago have given me entire satisfaction. As a dry clay press I think they have no superior. I prefer the "Lion" to the "Hydraulic". Ever wishing you success with the "Lion," I am,

Very Truly Yours, DRURY UNDERWOOD.

OFFICE OF
TENNESEE BRICK MANUFACTURING CO.,
NO. 7 MADISON STREET,
MEMPHIS, TENN., September 28, 1888.

St. Louis Iron and Machine Works, St. Louis, Mo.

GENTLEMEN: In reply to yours of 25th inst., we beg to say that our Company contracted with you last spring for one of your "Lion" Brick Machines, having concluded, after our President and Superintendent had thoroughly investigated most of other machines, including the Hydraulic, that yours possessed more advantages and promised better results. In due course the machine was delivereed, set up and put into operation. After having operated it all summer to full capacity, we are more than pleased with results and can heartily recommend the Machine to any one contemplating a purchase. To fully appreciate the merits it must be seen performing work.

Wishing you that eminent success which you so well merit we remain Yours Truly, C W. EDMONDS, Sec. and Treas.

The "Little Wonder" and Some of its Friends.

New England Terra Cotta Lumber Co.,......Boston, Mass.
Montreal Terra Cotta Lumber Co.,............Montreal, Can.
The. Rathburn Co.,....................................Deseronta, Can.
Summitt Brick Co.,....................................Cincinnati, O.
Louisville Brick Co.,..................................Louisville, Ky.
George Hinchliff,..Chicago, Ills.
E. Harland & Co.,...Chicago, Ill.
Harland & Harmes...Chicago, Ill.
Wm. Dunn..Coon Creek, Minn.
Muscatine Terra Cotta Lumber Co. ....Muscatine, Ia.

O. C. Atchison & Son,..................................Malvern, Ark.
South Western Terra Cotta Lumber Co.,..Hot Sgrings, Ark.
Raleigh Brick & Tile Co.,...............................Attalla, Ala.
Missouri Terra Cotta Lumber Co.,..................St. Louis, Mo.
Cambria Brick & Tile Co., (2 mills)..................Golden, Col.
Victoria Terra Cotta Lumber Co.,..............Melbourne, Aust.
Victoria Terra Cotta Lumber Co.,..............Sydney, N. S. W.
J. A. Bender,..Monticello, Ill.
Geo. J. Walters & Co.,.................................Chatsworth, Ill.
Sheldon Tile Co.,...Sheldon, Ill.

C. B. Woodley,..................
..................Sioux City, Ia.

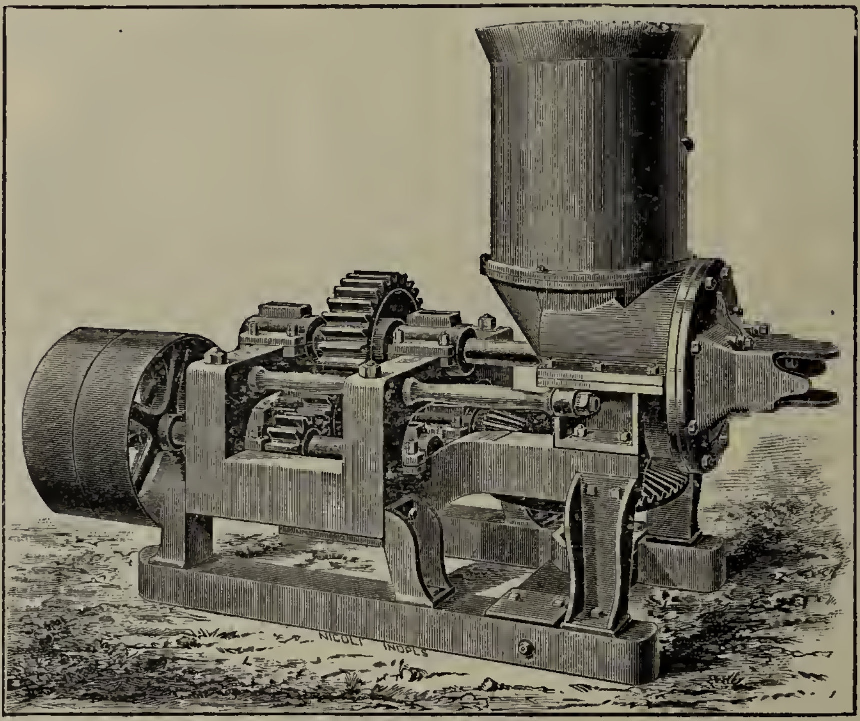
Montserrat Mining Co.,......
..................Montserrat, Mo.

T. H. Boyd & Co.,...............
................Montserrat, Mo.

St. Joseph Press BrickCo.,...
....................St. Joseph, Mo.

H. H. Stukenberg.,..............
...............Kansas City, Mo.

A. V. McKim.....................
.... Kansas City, Mo.



Lincoln Coal Co.,................
........................Lincoln, Ill.

S. Kroose,...........................
........................Lamoile, Ill.

Belvedere Brick & Tile Co.,..
...................Belvedere, Ill.

H. Ammon,........................
........................Decatur, Ill.

T. A. Hodge,.......................
.......................Kirklin, Ind.

Lanum & St. Clair,..............
.................Templeton, Ind.

Norcross Bros..Kansas City, Mo.
Kansas City & Wyandotte Press Br'k Co., Kansas City, Mo.
McBride & Patterson, (2 mills).................Kansas City, Mo.
Carter, Langworthy & Co., (2 mills).........Kansas City, Mo.
Wichita Terra Cotta Lumber Co.,..................Wichita, Kan.
J. S. Morse & Co.,..Horton, Kan.
Beattie, Benning & Ellis,..............................Atchison, Kan.

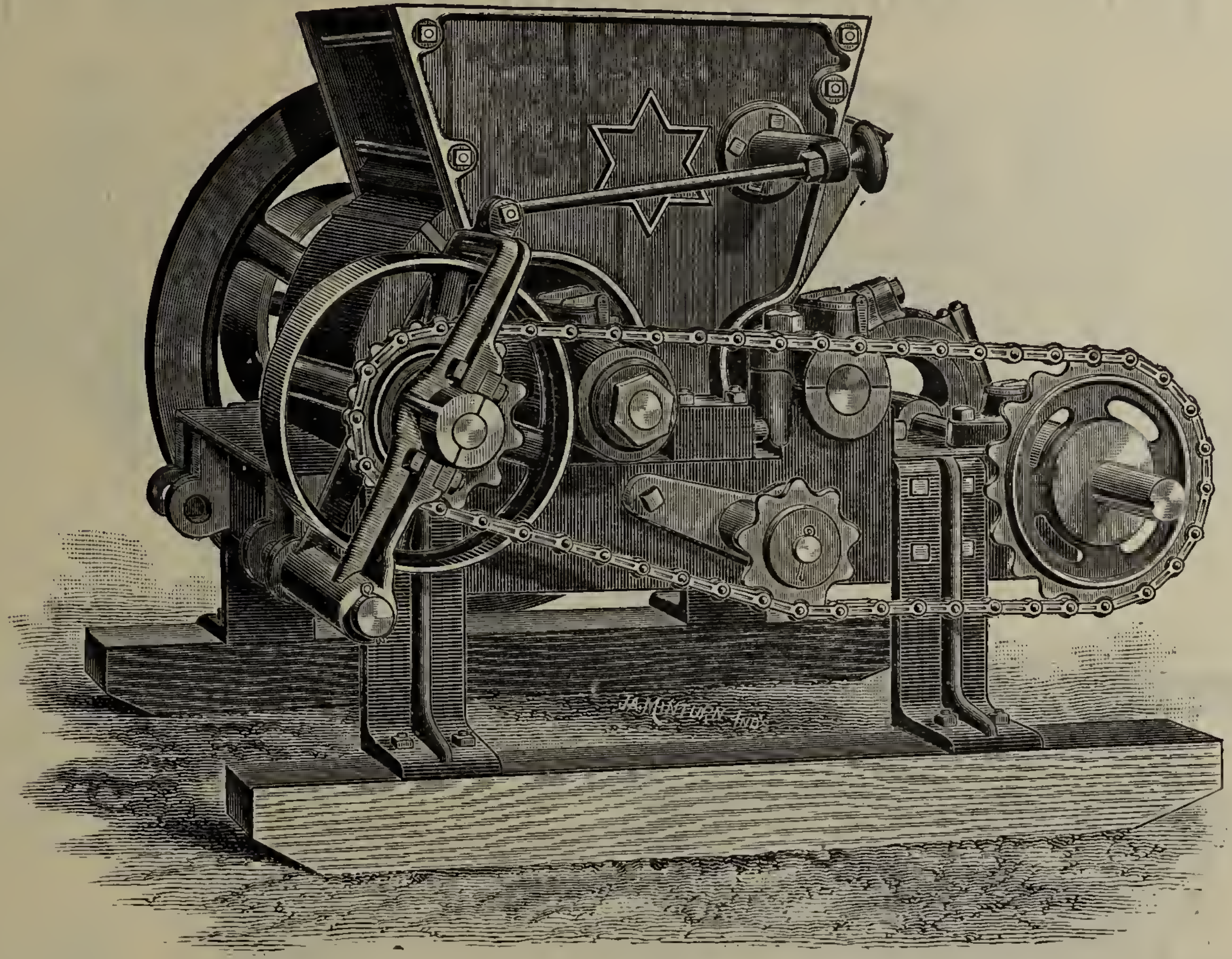
Vanhorn & Hudson...Boswell, Ind.
W. B. Owens,...Hobart, Ind.
S. W. Tanner,..Ashland, Wis.
Sanborn Brothers,...Ashland, Wis.
H. Johnson,..Ludington, Mich.
Pidgeon Brothers,...Salem, O.
Greenler & Whetstone,.....................................Defiance, O

☛For full particulars regarding the "Little Wonder" and a full line of Crushers, Pug Mills and other clay working supplies, address

THE WALLACE MFG. CO.,

FRANKFORT, INDIANA, U. S. A.

THE POTTS CLAY DISINTEGRATOR.


J.A. MINTURN IND.

The Disintegrator does not crush the clay, but removes successive portions from the mass thrown into the hopper, the action being similar to that of a file or grater. This leaves the clay of uniform texture and so thoroughly mixed that it is in the best possible condition for making brick or tile. Clay can be used direct from the bank with any of the brick machines in use if first run through the Disintegrator. It is the only machine that will feed both hard, dry clay and wet clay readily and prepare it for immediate use in the mill. All stones are ground to a powder and no clay is thrown out at the side. **It will pulverize all clods** and will mix sand with the clay evenly, if the clay is too strong. The speed with which this machine disintegrates clay makes it desirable for large brick and tile works and for many other uses in clay working. **We use no gearing and have no noise or wear. We guarantee satisfaction,** and give ample time for trial to to responsible parties.

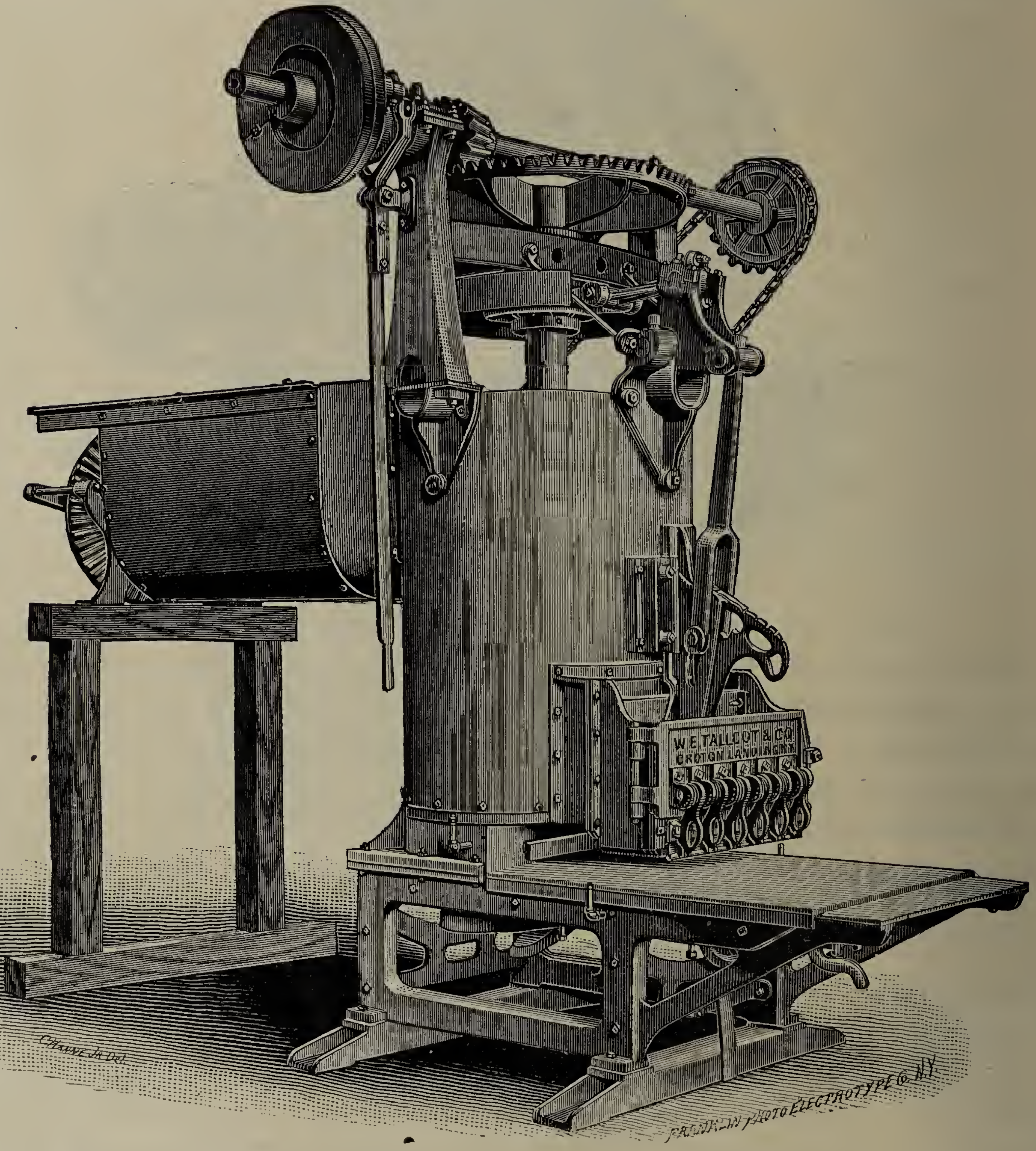
We are now prepared to offer a disintegrator that will thoroughly prepare your clay, no matter what its nature or for what purpose it is to be used. We have put on the market this season two new styles and now offer Style A, No. 1, capacity 20,000 brick per day; Style A, No. 2, capacity 30,000 brick per day; Style A, No. 3, capacity 40,000 to 50,000 brick per day; Style A, No. 4, capacity 60,000 to 100,000 brick per day; Style B, No. 2, capacity 30,000 brick per day; Style C, No. 1, capacity 20,000 brick per day; Style C, No. 2, capacity 30,000 brick per day; Style C, No. 3, capacity 40,000 to 50,000 brick per day; Style D, No. 2, capacity 30,000 brick per day; Style D, No. 3, capacity 40,000 to 50,000 brick per day; Style D, No. 4, 60,000 to 100,000 brick per day.

☞Send for special circular with full description and prices.

C. & A. POTTS & CO., 418 to 428 West Washington Street, INDIANAPOLIS, IND.

W. E. TALLCOT & CO'S.

I. X. L. Brick Machine and Improved Pug Mill.


W. E. TALLCOT & CO
CROTON LANDING N.Y.
C.Hauve Jr Del.
FRANKLIN PHOTO ELECTROTYPE Co. N.Y.

This is a simple and powerful machine, making a superior brick and possessing advantages over all others. It is the result of years of experience in using and manufacturing brick machines. Among its advantages are *Great Strength, Simplicity and Durability* few parts, well protected from sand, yet easy of access for adjustment, renewal and repair. No wood is used in its construction; it is made all of iron and steel. Perfect automatic action to prevent breakage by stones or other obstructions. Great tempering capacity and ability to mould very stiff clay. It is easily understood, easily operated, easily kept in order. Quality of brick made, unsurpassed

The I. X. L. is eipecially designed and built for heavy work. Weight of Machine and Pug Mill 10,000 pounds. Weight of Machine without Pug Mill, 7500 pounds. Send for circular and prices.

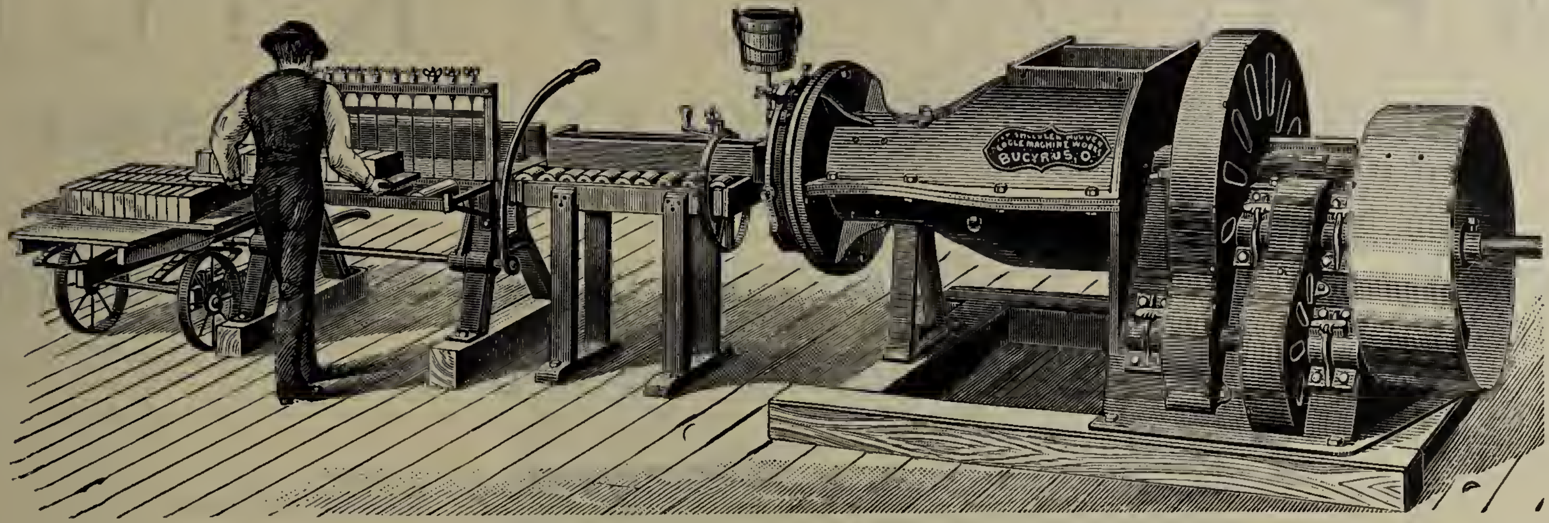
It will pay you to use the I. X. L.

W. E. TALLCOT & CO.,
Croton Landing, New York

FREY, SHECKLER & HOOVER.

BUCYRUS, OHIO.

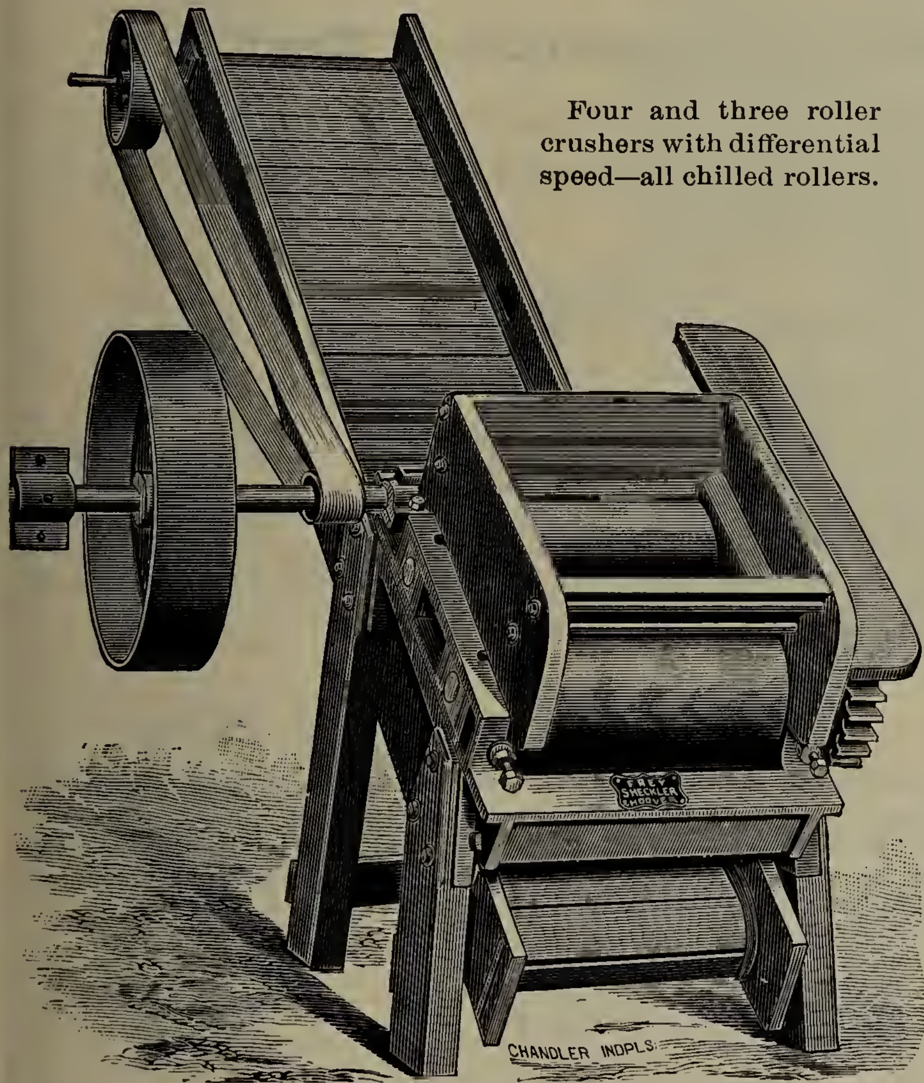
The Automatic Brick Cutting Table for one, two or three streams of brick, tile or hollow blocks, will carry off on endless belt.



The Acme Machines have steel shafts, force feed hoppers, friction clutch pulleys and the greatest varieties of cutting tables to suit all clays and demands.

The Acme Special Brick Machine with Board Delivery Cutting Table will make 40,000 brick per day with the new system and appliances. Brick can be dried on the pallets or hakes. A brick-separating and haking device is now in construction.

OUR AUTOMATIC CUTTING TABLE a great success for end-cut brick.
THE MASCOT BRICK AND TILE MACHINE for light power.
THE ACME STANDRAD MACHINE for tile (from 2½ to 20 inches), and brick.
THE CENTENNIAL BRICK AND TILE MACHINE for tile (from 2½ to 20 inches,) and brick.

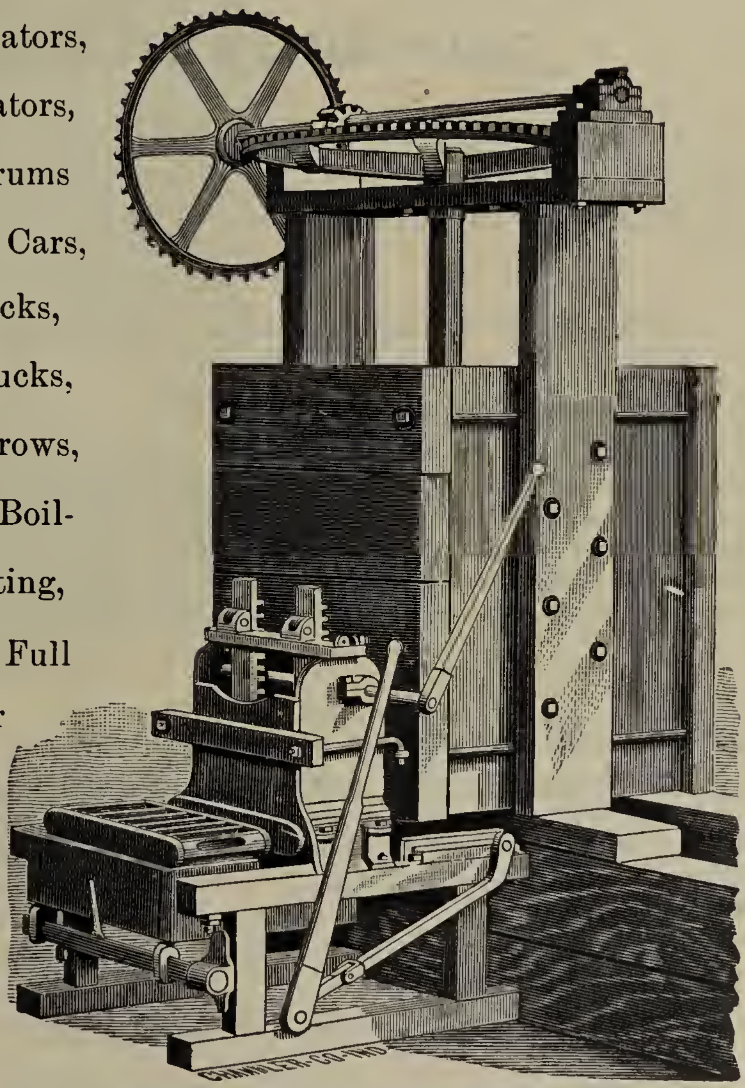


Four and three roller crushers with differential speed—all chilled rollers.

We make thirteen different patterns of Roller Clay Crushers. All rollers best chilled iron.

PLANS FOR KILNS FURNISHED CUSTOMERS.

Clay Elevators, Tile Elevators, Steam Drums and Dump Cars, Tile Trucks, Brick Trucks, Wheelbarrows, Engines, Boilers, Shafting, Pulleys. Full outfits for Brick and Tile Factories and Fire Clay Works.



The Eagle Brick Machine.

Cheapest and Simplest for Horse and Steam power (16,000 brick per day.)

Send for illustrated circulars to

FREY, SHECKLER & HOOVER, Bucyrus, Ohio.

MORRISON'S IMPROVED KILN

FOR -:- BURNING -:- CLAY -:- WARES

Especially adapted to Burning Common, Repressed and Ornamental Brick.

PATENTED IN UNITED STATES AND CANADA.

SUCCESSFUL! DURABLE!

Daily product of our Kilns in the United States, One-Half Million Bricks. Our claims fully substantiated BY OUR PATRONS. We claim ninety to ninety-five per cent. hard brick. Arch bricks all Fronts and Pavers and none damaged—of uniform color. Pressed brick burned without fire-marks—coal screenings preferred for fuel. One fireman for two hundred thousand bricks. The

Only Kiln That Regulates the Temperature of Heat

And directs its course by a system of air drafts, giving complete control of the degree of heat, as well as its manipulation. This system we have covered by letters patent. Any persons using these air drafts are liable to prosecution for infringement.

Read the following testimonial from a recent patron, and another new one from an old patron:

Knoxville, Tenn., October 31st, 1888.

R. B. Morrison, & Co., Rome, Ga.:

GENTLEMEN—I have used your *Improved Kilns* during the past twelve months and cheerfully report the result. We burn our bricks in your Kiln at a cost of sixty-five cents per thousand for fuel and labor; a saving to us, over our old method, of eighty cents per thousand on the two items. My saving in waste brick in the kiln and at the building is fully *ten per cent.*, or sixty cents per thousand in other words. Every time I burn your kiln of 300,000 bricks it is a saving to me of *more than four hundred dollars* over the old process. I find your kiln durable and simple to operate. We use coal screenings for fuel. Have no waste in arches, and burn ninety per cent. hard brick. I have no hesitation in pronouncing your kiln a success in every respect, as you make no claims it does not fulfill. Yours Truly,

REPS. JONES.

Atlanta, Ga., July 20th, 1888.

R. B. Morrison & Co., Rome, Ga.:

GENTLEMEN—We have used your Improved Kilns for three years and during that time have burned upward of a hundred millions in them and wish to emphasize our former statement in regard to your kilns. They are reliable, durable, and the best kilns for our purpose, we have been able to find after investigating many of the various kilns in use, and say to our friends of the trade: If you want kilns that will burn your brick nearly all hard, and do it every time, burn them economically and without loss, and with little cost for repairs, secure the Morrison Kiln.

CHATTAHOOCHEE BRICK CO., per GEO. W. PARROT, Vice-Pres.

—WE SELL OUR KILN STRICTLY ON MERIT—

☞For descriptive circulars, additional testimonials, and all information desired, address

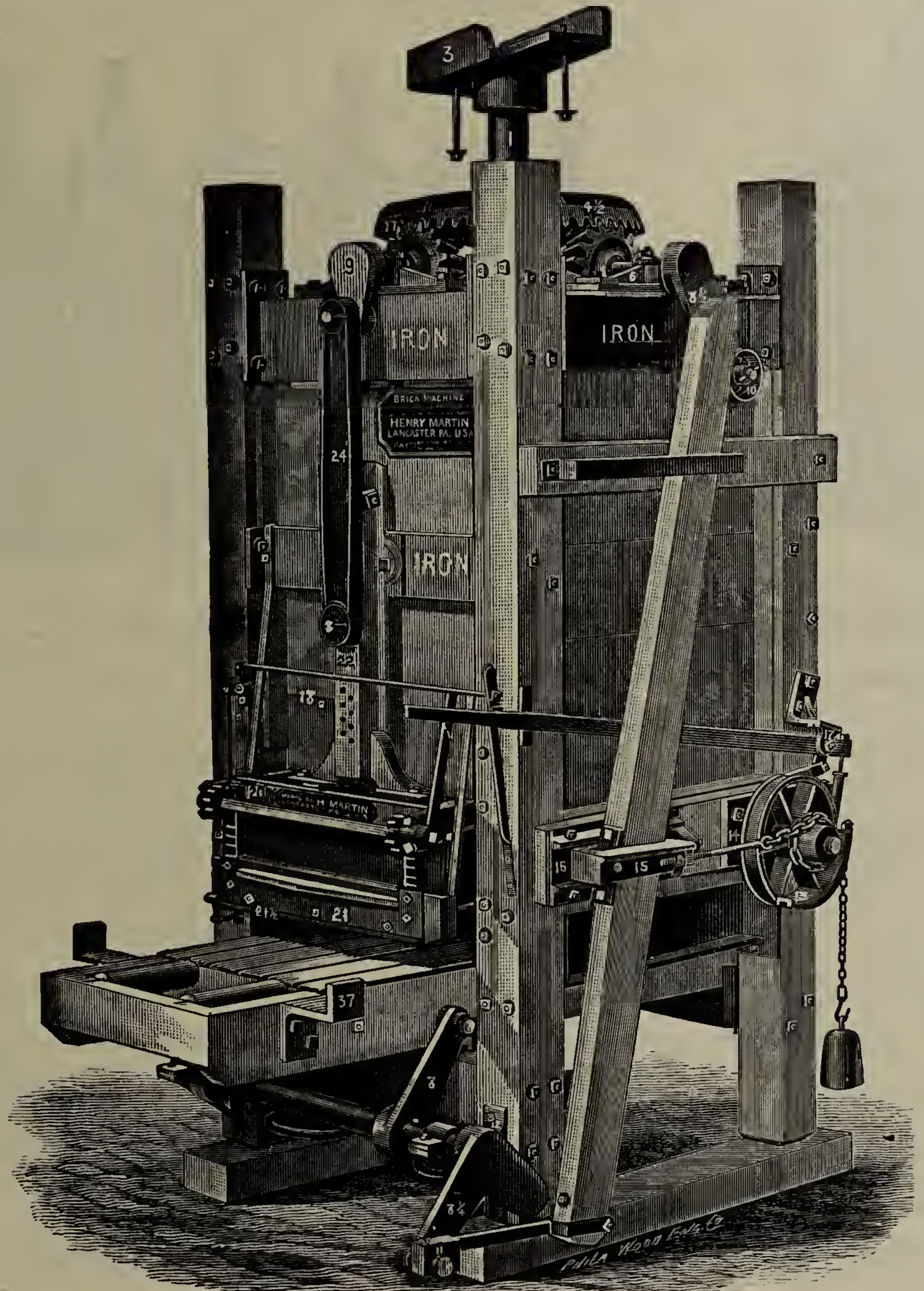
R. B. MORRISON & CO.,

Box 335, - - - - ROME, GEORGIA.

The Henry Martin Brick Machine.

For Steam or Horse-Power.

FOR STEAM OR HORSE-POWER.



FOR STEAM OR HORSE-POWER.

This cut represents our Horse-Power Machine. It has Iron Rails. It is the strongest. It is the best. It is the most simple. It is the most perfect. It does the best work. It works any clay. It does not get out of order. It is not liable to break down. It stands hard usage. It can be changed to Steam Power.

BETTER THAN EVER.

Our machines are this season the Best ever built by our Mr. Henry Martin, whose thirty years' experience has rendered him familiar with the wants of the Trade.

For Strength, Durability, Qoantity of Output and Quality of Work, they have no equal.

Brickmakers make no mistake when they buy the Henry Martin Machine.

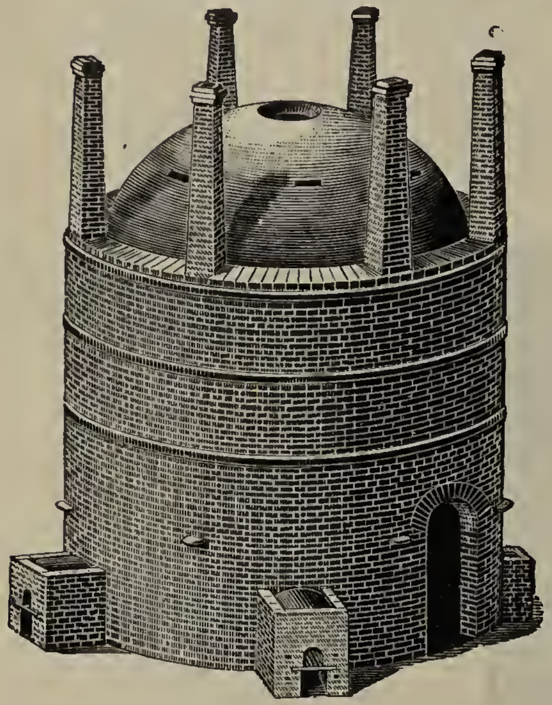
MANUFACTURED BY

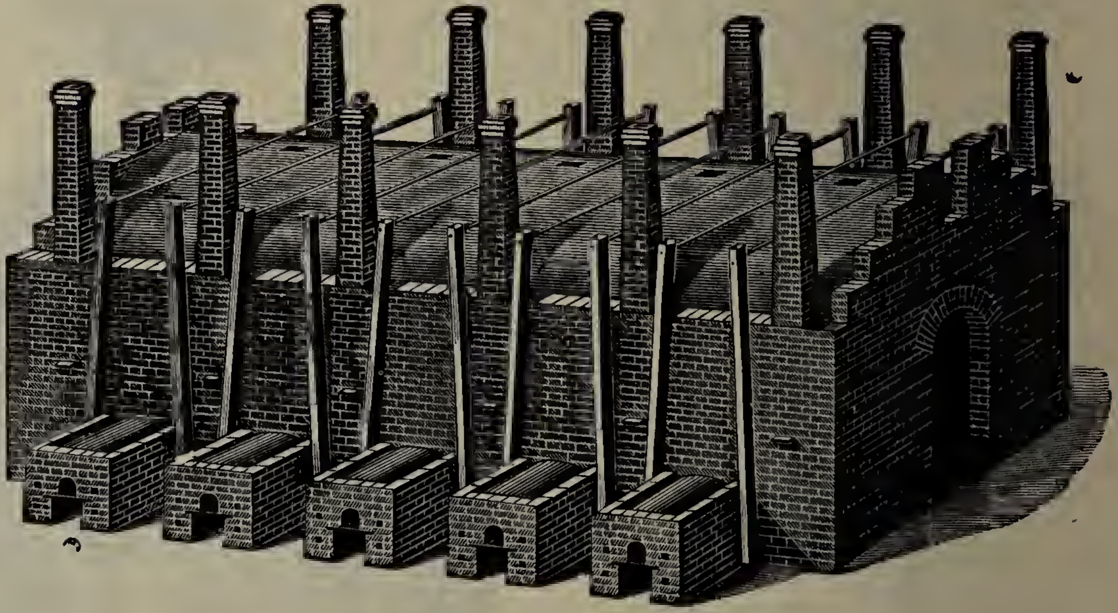
The Henry Martin Brick Machine Mfg. Co.,

Send for a Catalogue. LANCASTER, PA., U. S. A.

THE EUDALY KILN.

BURNS ANY KIND OF CLAY OR WARE.





THE DOWN-DRAFT KILN.

UNIFORMITY IN BURNING is without a doubt the most essential feature to clay workers. Especially is this the case with fine clays where it is desired to have the wares of uniform color, size and hardness.

In the construction of these kilns particular attention has been paid to this point, by having first carefully examined the subject of drafts and the strength and nature of the different kinds of fuel. The size of the kiln, the size and number of furnaces, flues and chimneys must always sustain the proper relation to each other for a perfect draft. Too much draft is as dangerous as too little. One of the greatest mistakes of kiln inventors and builders is that they utterly disregard the important subject of drafts.

ABILITY TO DIRECT THE HEAT TO ANY PART OF THE KILN is equally as important as a proper draft. Unless the burner has control of the heat in the kiln he has no assurance of a uniform burn. In these kilns if the burner finds the wares too hot in any portion of the kiln he can in a moment shift the heat to any other part where it is not so hot, or what is better, if he has two or more kinds of wares in the kiln, one of which requires more burning than another, he can easily give that portion of the kiln an extra amount of heat. We claim that this is the only kiln in which these results can be attained successfully.

For this reason wares can be burned by this system **more uniformly** than by any other.

Practically there is no difference from top to bottom, yet this is purely a *down draft* kiln. There are no inside dampers or cut-offs. **Everything about the kiln is permanently built.**

ECONOMY OF FUEL AND LABOR is perhaps the second most important feature of any kiln. We hear a great deal said about "economy in fuel and labor," but to understand what is necessary to a fuel and labor saving kiln one should be thoroughly acquainted with all kinds of fuel and the conditions necessary to get the greatest number of heat units out of it, and at the same time **distribute the heat to the burning wares in the most effective manner.**

We claim that our latest improved furnace is the most **complete economizer** of fuel that has ever been invented.

The construction is purely scientific, and is made by first obtaining the chemical requisites necessary to insure perfect combustion and then building a furnace to bring about these results. Different kinds of fuel require a different size and construction of furnace. We use any kind of fuel, soft coal, screenings, oil, gas or wood.

COST OF CONSTRUCTION—These kilns require no large stack, which ordinarily costs as much as the kiln proper. Many persons think they must have a large, tall stack in order to have sufficient draft to get the bottom of the kiln burned.

This is certainly a mistaken notion.

The things that are required, however, are a correct location and size of furnaces, flues and chimneys with reference to each other and the kiln. When these are properly attained the burner need have no fear about draft.

In these kilns great care has been taken to adjust these relations in such a way that the expensive stack is not at all required, and a much better draft obtained.

DURABILITY.—Each part of these kilns is built with special reference to strength and durability.

The furnaces, which are perhaps the most perishable parts of any kiln, are in these kilns made very strong and durable.

Those parts most liable to burn out can be easily removed and replaced without damage to the other parts of the furnace.

Rules are given by which a builder of these kilns can get the strongest crown and best supports to the kiln.

SIZES.—These kilns can be built either **round** or **square**, and of **any** desired **size**. A number of these kilns are now in use that burn from **150** to **250** thousand bricks at a time. The walls are built **twenty-four inches thick.** They should be lined throughout with fire-brick where the clay is very hard to burn. Good kilns can be made, however, without using fire-brick for any part except the **furnaces** and **bags.** In asking for cost of construction **state size of kiln in feet wanted,** whether the kiln walls, crown or bottom are any or all to be lined with fire-brick.

DRAWINGS and specifications for building kilns will be furnished any who purchase *kiln or yard rights.* We usually can furnish a man to superintend the building if desired.

For further information address

W. A. EUDALY,

64 Johnston's Building, - - - - CINCINNATI, OHIO.

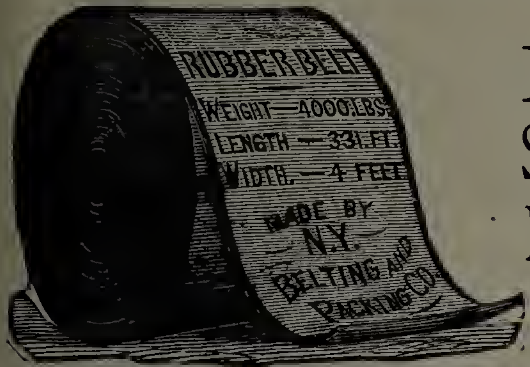
JOHN H. CHEEVER, Treas.
J. D. CHEEVER, Dep. Treas.

NEW YORK BELTING & PACKING CO., Park Row, N. Y.

Oldest and Largest Manufacturers in the U. S. of

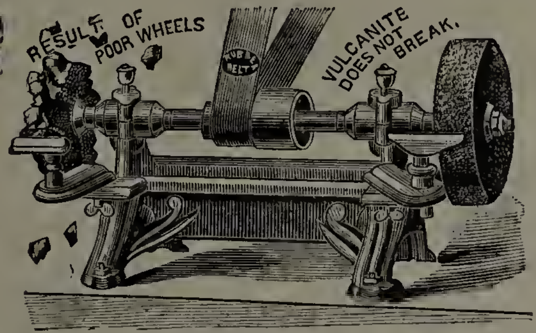
VULCANIZED RUBBER FABRICS FOR MECHANICAL PURPOSES.

RUBBER BELTING, PACKING, HOSE.


RUBBER BELT
WEIGHT—4000 LBS.
LENGTH—331 FT.
WIDTH.—4 FEET
MADE BY N.Y. BELTING AND PACKING CO.

FIRE TEST
STEAM AND WATER
LINEN AND COTTON
HOSE

RUBBER TEST HOSE.



RUBBER MATS,
RUBBER MATTING,
RUBBER STAIR TREADS.

SOLID VULCANITE
Emery Wheels.
DO NOT CASE HARDEN.
Cut Free and Cool.
KNIFE GRINDING WHEELS A SPECIALTY.

BRANCHES { W.S.Nott, & Co., MINNEAPOLIS; Post & Co., CINCINNATI; W.D.Allen & Co.,CHICAGO; Hendrie & Bolthoff, DENVER; Rhodes & Waters, ATLANTA; Macey & Co., Nashville; Winett & Rivers, San Francisco; Cameron & Barkley, Charleston; Baker, Sloo & Co., N.Orleans; Ripley & Bronson, StLOUIS.

ROOT'S NEW WATER TUBE STEAM BOILER.

SAFE, ECONOMICAL, DURABLE.

Recently adopted by the Cincinnati, St. Paul, Louisville, Detroit, Columbus, Philadelphia, Jersey City Electric Light Co's, and many others.

ABENDROTH & ROOT M'F'G. CO.,

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LIDGERWOOD HOISTING ENGINES.

Engine and Boiler Combined.

SPECIALLY ADAPTED FOR
General Manufacturing and Mining Purposes,
Contractors, Electric Lighting, Pile Driving, Dock Building, Excavating, &c.
300 STYLES AND SIZES.
OVER 5,000 IN USE.

LIDGERWOOD MFG. CO.,
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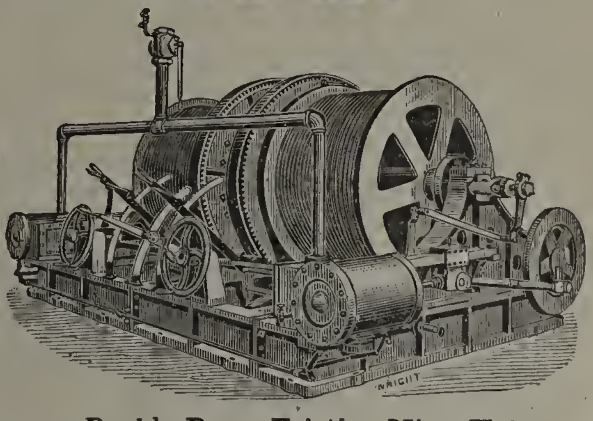
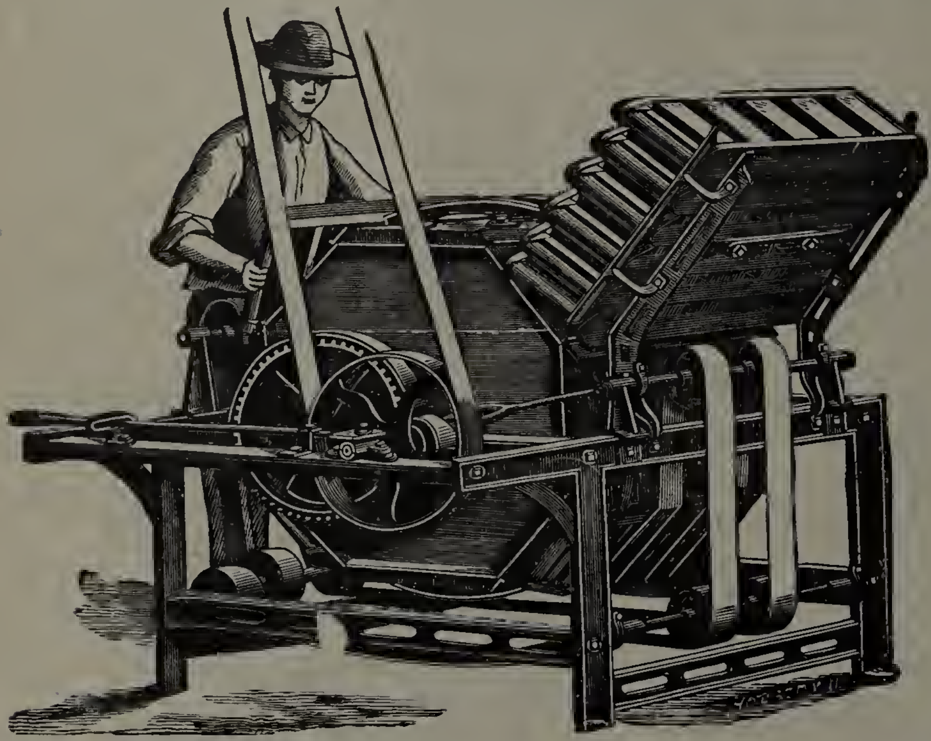


Double Drum Friction Mine Hoist.

New Catalogue for 1889 Now Ready.

AGENTS—Rochester Machinery Co., Chicago, St. Louis, Detroit. | Hendrie & Bolthoff Mfg. Co., Denver.—Utah & Montana Mach. Co., Salt Lake City, Utah.

Champion Brick Mould Sanding Machine.

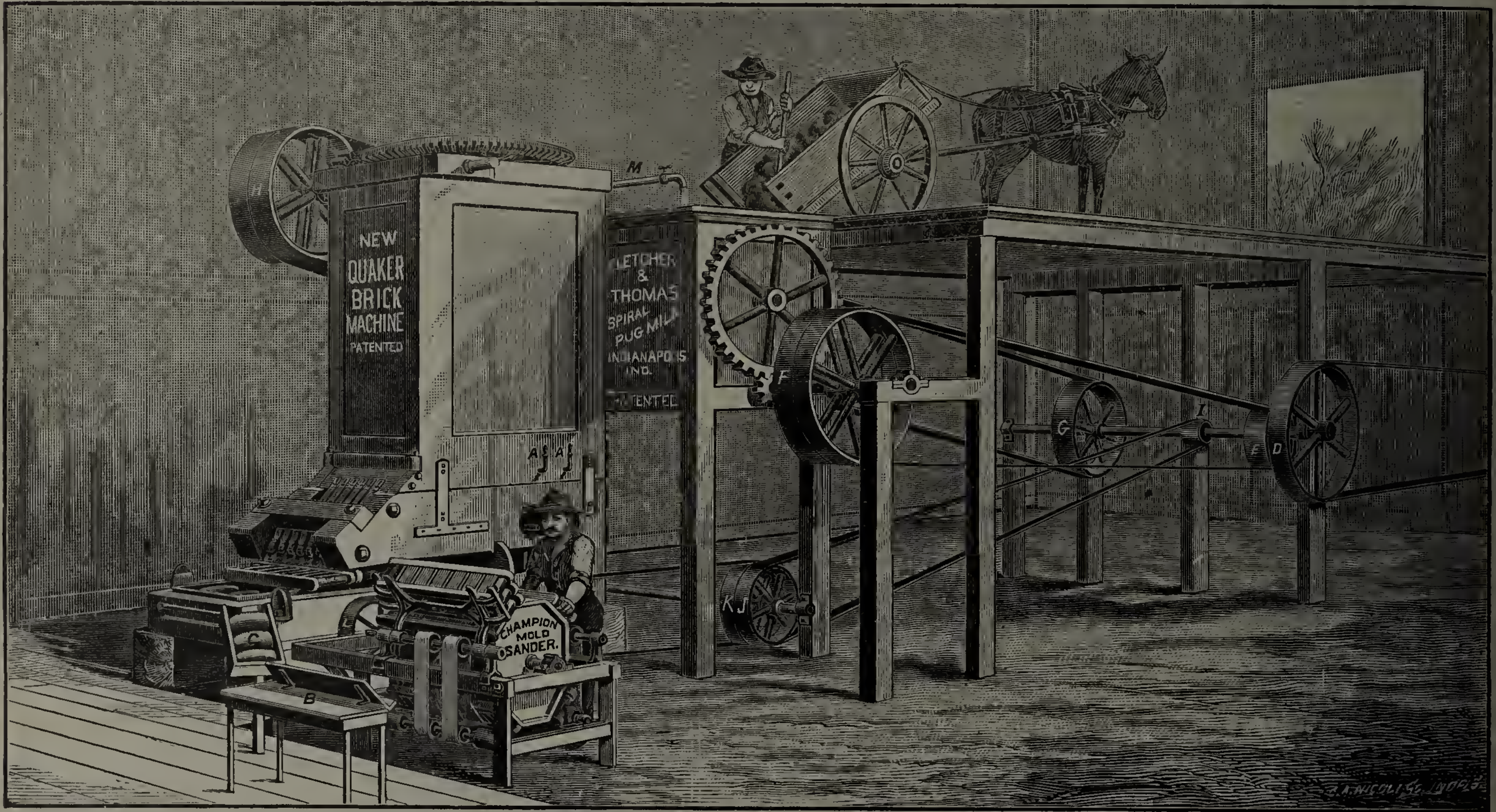


We respectfully call the attention of the brickmaking public to the CHAMPION BRICK MOULD SANDING MACHINE. It is the only Mould Sander on the market, and though, comparatively speaking, but a new machine, it has been such a saving in labor and sand, and has given such complete satisfaction to all who have used it, as it never strikes and is always ready for work, that it is now in operation in nearly every State in the Union. Send for Circular and Price List of our SANDER.

Although we guarantee every machine sold, we would refer you to the authors of some of the testimonials published in our circulars for a more practical recommendation.

A. H. NEWTON & BROS.,
Sole Manufacturers,
COHOES, N. Y.

FLETCHER & THOMAS' EMPORIUM OF BRICK MAKERS' SUPPLIES.


NEW QUAKER BRICK MACHINE PATENTED
FLETCHER & THOMAS SPIRAL PUG MILL INDIANAPOLIS IND. PATENTED
CHAMPION MOLD SANDER.
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Our Complete Heavy Steampower Belted Outfit.

Over 1,000 Quaker Machines—Steam and Horsepower now in operation throughout the United States. Capacity of Steampower, 30,000 to 40,000 per day. Capacity of Horsepower, 15,000 to 20,000 per day. We furnish everything connected with brickmaking and contract to furnish complete outfits, set up and put in operation. Correspondence solicited. Send for illustrated catalogue.

Norfolk, Va., Nov. 16, 1888.

Gents—In reply to yours, we take pleasure in stating that the New Quaker Extra Heavy Steam Outfit you sold us last spring is working to our entire satisfaction. It turns out a nice brick, is of simple machinery and at the same time durable, and we recommend it. Yours Truly, Williams & Myers.

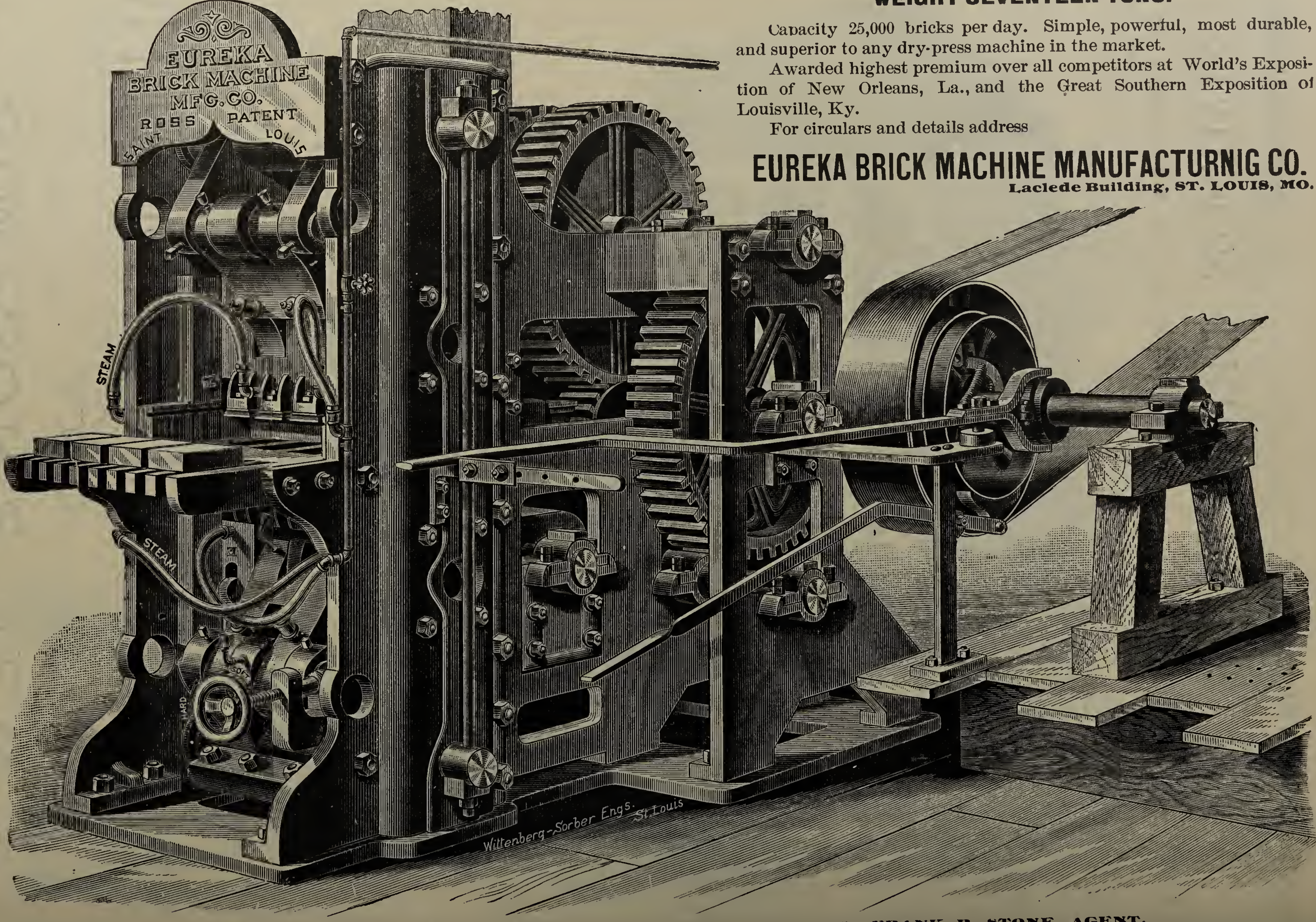
Huntsville, Ala., Nov. 19, 1888.

Gents—Will say in regard to the Improved horse power Quaker Machine bought of you last spring, we are well pleased with the way it works, in fact, it has given entire satisfaction. We turn out 12,000 to 14,000 brick per day but could do better.
Yours Respectfully, S. L. Frankenberger & Co.

FLETCHER & THOMAS,
Indianapolis, Ind.

[Mention the Clay-Worker.]

Improved Eureka Dry Press Brick Machine.



WEIGHT SEVENTEEN TONS.

Capacity 25,000 bricks per day. Simple, powerful, most durable, and superior to any dry-press machine in the market.

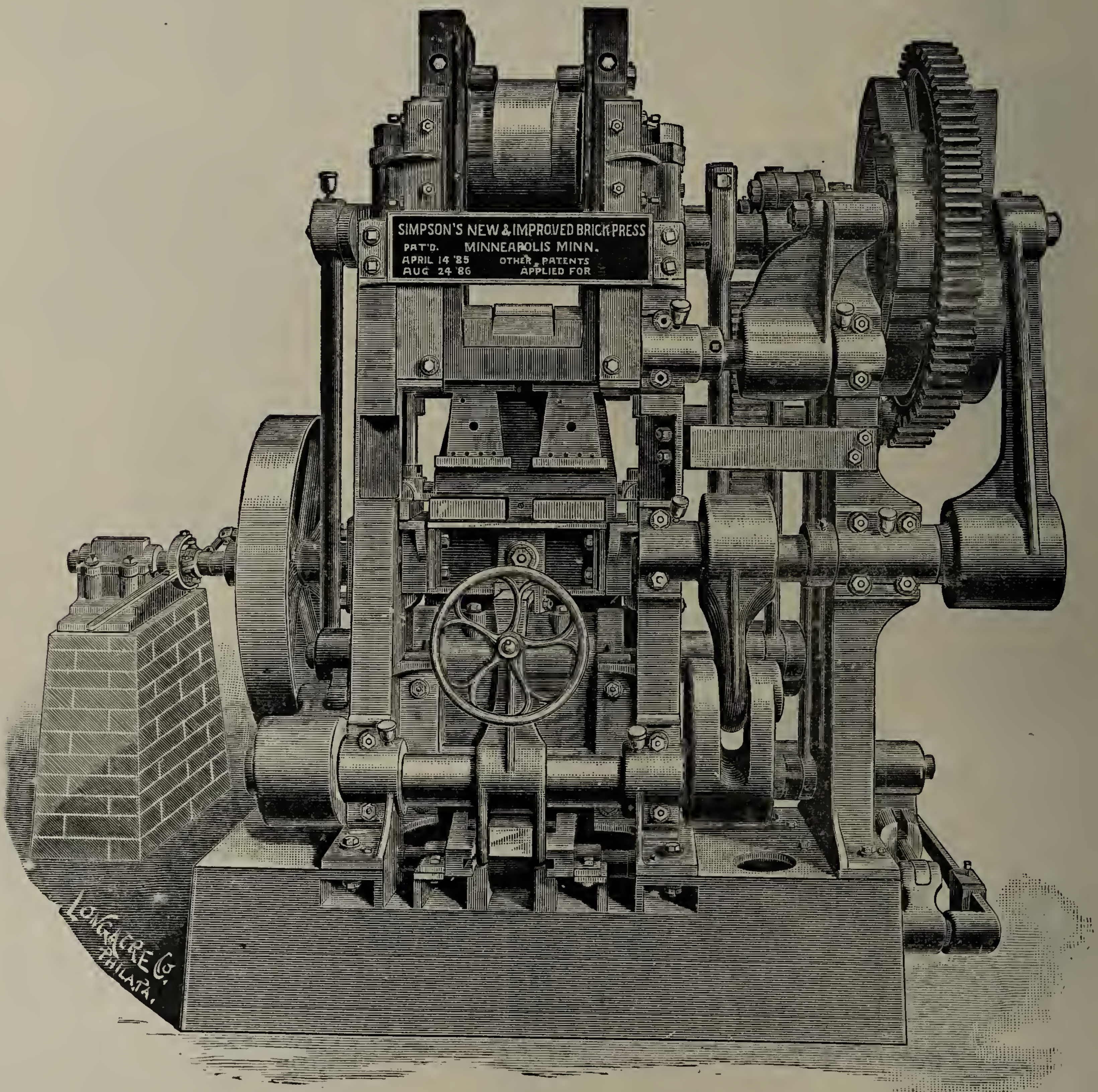
Awarded highest premium over all competitors at World's Exposition of New Orleans, La., and the Great Southern Exposition of Louisville, Ky.

For circulars and details address

EUREKA BRICK MACHINE MANUFACTURNIG CO.
Laclede Building, ST. LOUIS, MO.

EASTERN AGENCY, 1321 F STREET, N. W., WASHINGTON, D. C., FRANK P. STONE, AGENT.

SIMPSON'S NEW AND IMPROVED BRICK PRESS.



Send for particulars and prices

SIMPSON BRICK PRESS CO.,

44 Tribune Building, MINNEAPOLIS, MINN.

St. Louis Iron and Machine Works, Iron Founders and Builders of Heavy Machinery.

ESTABLISHED 1854.
INCORPORATED 1875.

Office and Works: Main St. and Choteau Avenue,

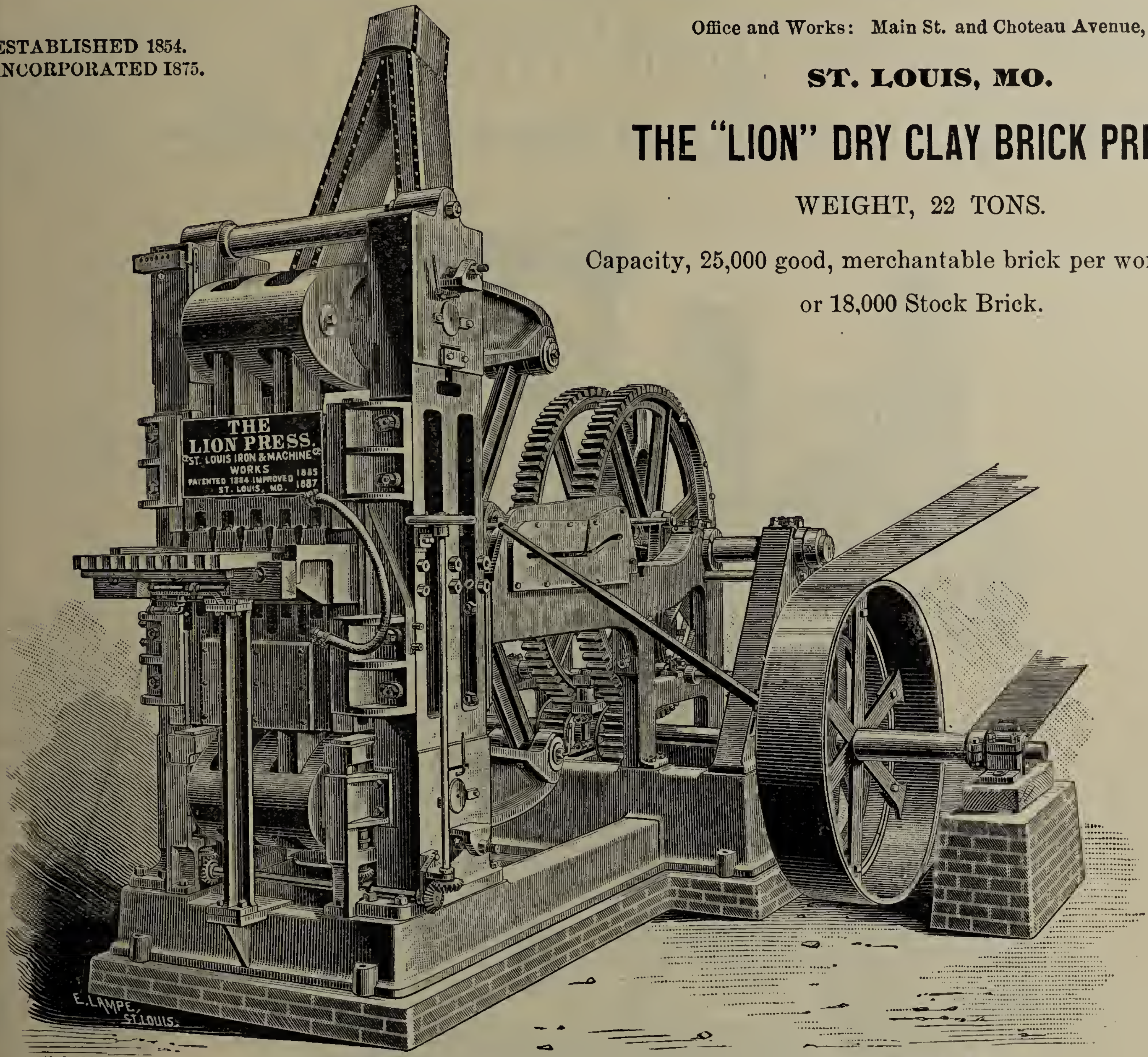
ST. LOUIS, MO.

THE "LION" DRY CLAY BRICK PRESS.

WEIGHT, 22 TONS.

Capacity, 25,000 good, merchantable brick per working day,

or 18,000 Stock Brick.



We claim the following essential features and advantages for our Machine:

1. The main feature of this machine is its great strength, power and durability. The pressure on each brick being 40 tons, and the working parts are so strongly constructed that there is no spring or give under this working strain. 2. The great simplicity and openness of framing and construction, so that every part of the machine is easily accessible for inspection, lubrication and adjustment, thereby reducing the necessary repairs, incidental to every Brick Press, to a minimum. 3. Pressing 5 bricks at each revolution of Machine, keeps the regular force of off-bearers and setters fully employed, which a 4 Brick Machine cannot do. 4. The adjustment of machine from common to stock brick and vice-versa, can be made in a few minutes' time.

Besides the Press, we manufacture and furnish a complete set of clay preparing Machinery, Elevators, Mixers, and Rollers; also Engines and Boilers complete. We also build different kinds of Steamboat Machinery and Steam Boilers, Corliss Engines, Cotton Compresses, Water Work Plants, Coal and Mineral Mining Machinery, Bridge Work, Hoisting Travelers, Cranes and Elevaters; also general and large castings and Machinery. Any further information cheerfully given.

TESTIMONIALS.

KANSAS CITY, MO., September 28, 1888.

St. Louis Iron and Machine Works, St. Louis, Mo.

GENTS: The two "Lion" Presses I bought from you about two years ago have given me entire satisfaction. As a dry clay press I think they have no superior. I prefer the "Lion" to the "Hydraulic". Ever wishing you success with the "Lion," I am,

Very Truly Yours, DRURY UNDERWOOD.

OFFICE OF
TENNESEE BRICK MANUFACTURING CO.,
NO. 7 MADISON STREET,

MEMPHIS, TENN., September 28, 1888.

St. Louis Iron and Machine Works, St. Louis, Mo.

GENTLEMEN: In reply to yours of 25th inst., we beg to say that our Company contracted with you last spring for one of your "Lion" Brick Machines, having concluded, after our President and Superintendent had thoroughly investigated most of other machines, including the Hydraulic, that yours possessed more advantages and promised better results. In due course the machine was delivereed, set up and put into operation. After having operated it all summer to full capacity, we are more than pleased with results and can heartily recommend the Machine to any one contemplating a purchase. To fully appreciate the merits it must be seen performing work.

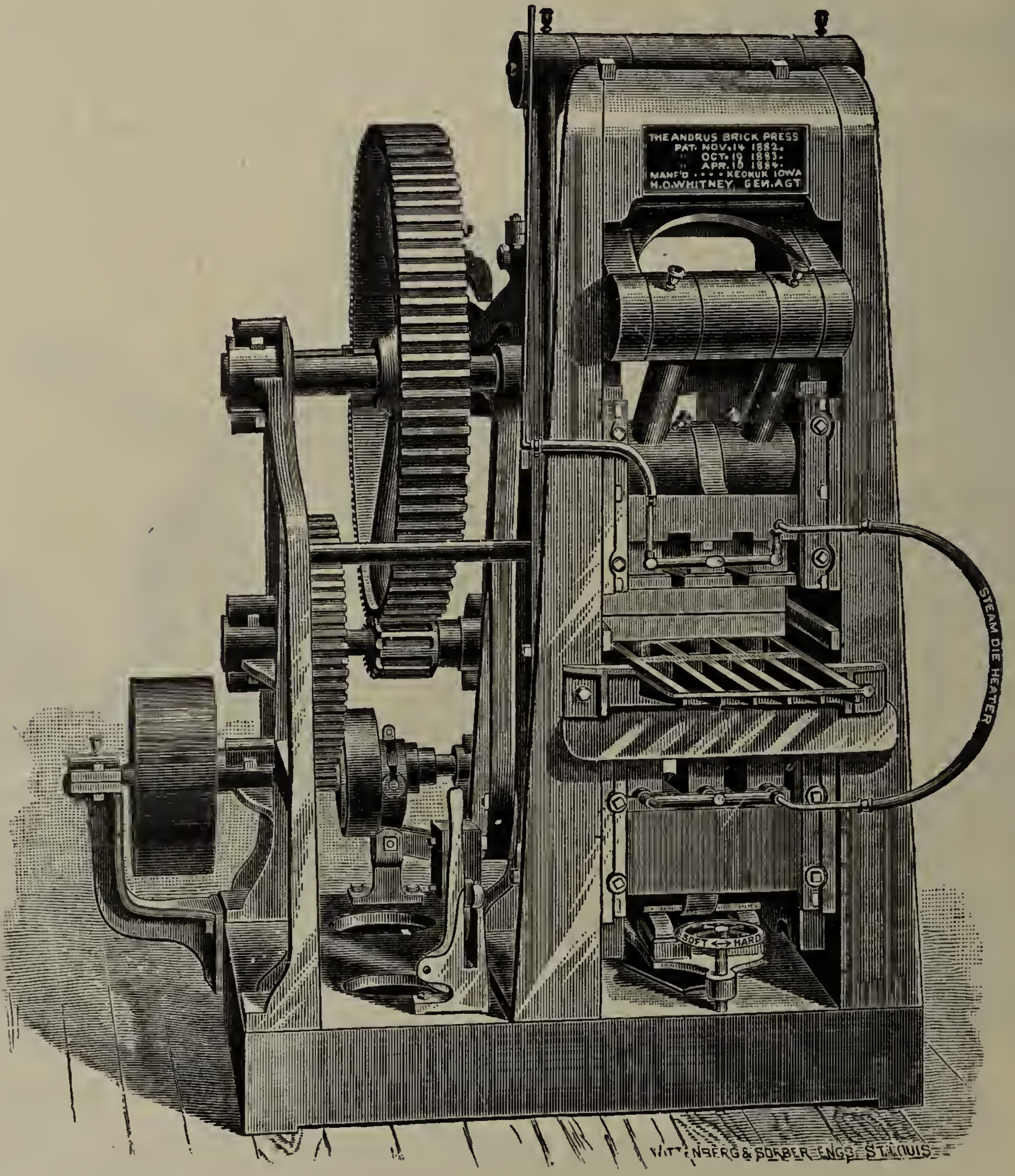
Wishing you that eminent success which you so well merit we remain

Yours Truly, C W. EDMONDS, Sec. and Treas.

—THE—

Improved Andrus Double Pressure Brick Press.

UNRIVALLED FOR SIMPLICITY, POWER AND DURABILITY.



The Pressed Brick made on the Andrus Machine have been tested by the U. S. Government and adopted for fronts in Government Buildings.

Built at our OWN FACTORY with heavy forged STEEL pressure arms and fully guaranteed against breakage. Not an experiment but a TRIED and PROVEN success.

60 machines in successful operation the past season. Examine it before purchasing.

Ittner Bros., St Louis, Mo., using the Andrus Presses produced 36 large kilns of brick of unsurpassed quality the past summer.

Samuel J. Rose & Son, Chester, Pa., and many others have made a splendid success.

The Andrus Press, Clay Crushers and Pulverizers can be seen in operation at all times at Our Factory.

Send for descriptive circular and reference, address

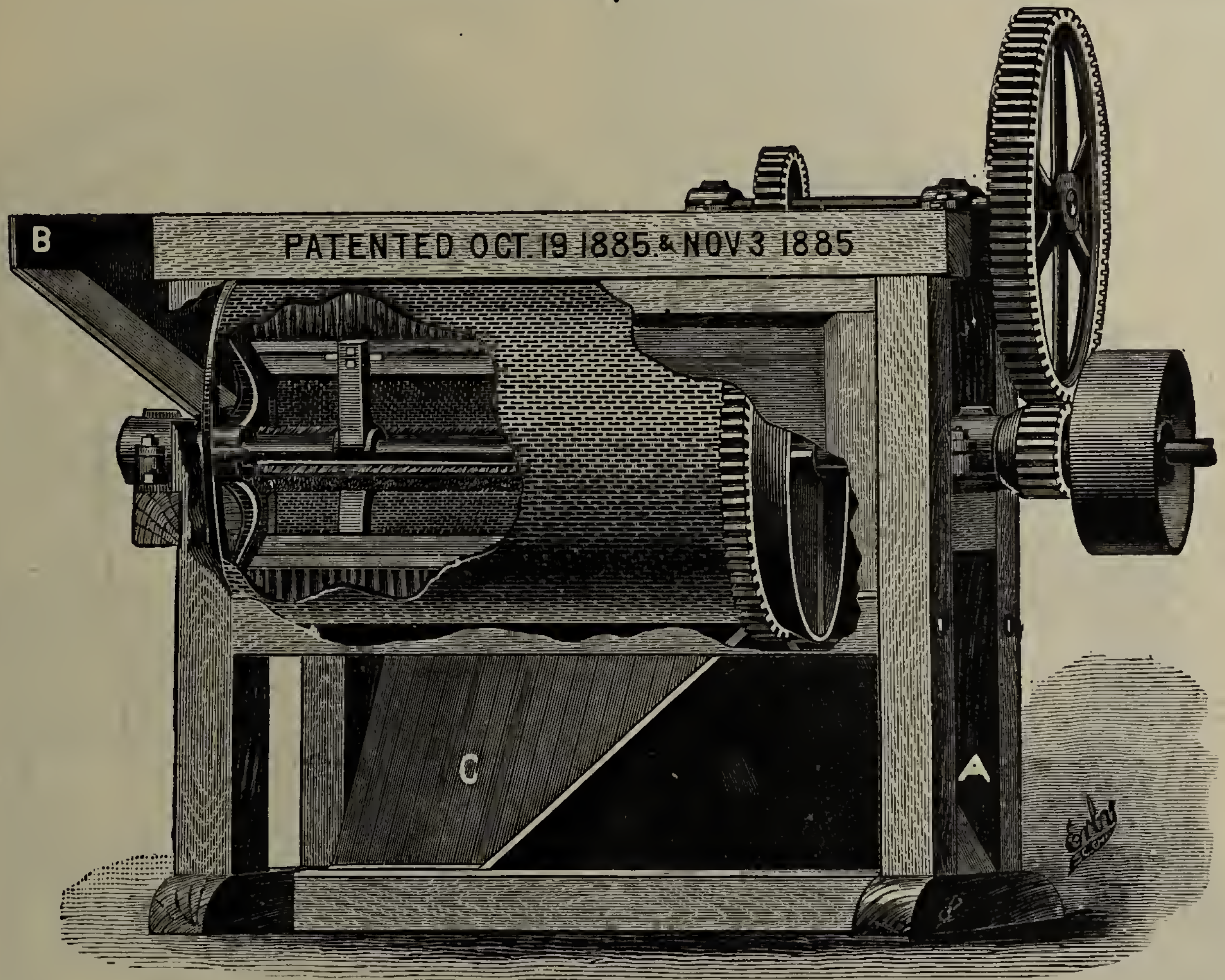
H. O. WHITNEY, Gen'l Agent,

General Office and Factory, KEOKUK, IA. (Mention the Clay-Worker.) KEOKUK, IOWA.

THE BOYD

Clay ◎ Pulverizer ◎ and ◎ Stone ◎ Separator.

ACKNOWLEDGED THE BEST.



B.
Dry or Semi-Dry Clay goes in here.

C.
Pure Clay comes out here.

A.
All Stones, Pebbles & foreign substances come out here.

I OFFER to those engaged in Clay-working, a machine that has no equal for removing Stones, Roots, Pebbles, or other foreign substances, and reducing Clay to Granules, for Dry or Semi-Dry Press Brick making, Terra Cotta, Tile, or other articles manufactured from Clay, which require a *Strictly Pure Quality.*

It is especially valuable to makers of Fine Press Brick, Tile, or Terra Cotta, as the lime-stones and pebbles are removed entire—not crushed and left in the clay. This machine is not a crusher, and will not pulverize wet clay or mud. The clay to be pulverized in this machine must be in a dry or semi-dry state.

Its capacity is from 40 to 60 tons per day of ten hours, and requires only from 4 to 6 horse-power to drive.

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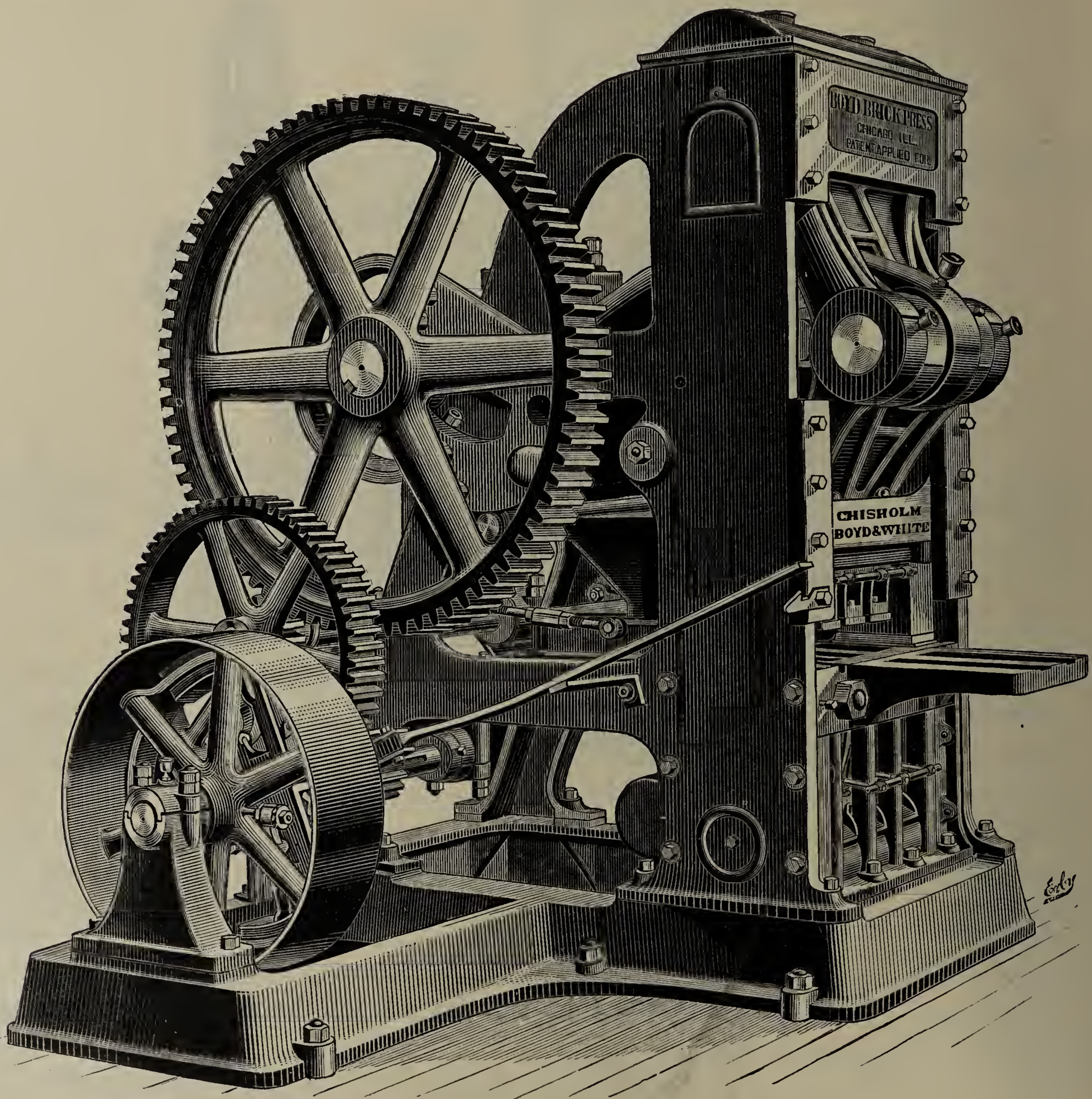
✻ Agency of the Carman Dry or Semi-Dry Press Brick Machine. ✻

THE BOYD BRICK PRESS

Will make a greater quantity of Perfect Brick (of maximum weight) per mould for a consecutive number of days than any other Semi-Dry Brick Press in the world and Superior in Quality to Hydraulic Pressed Brick.



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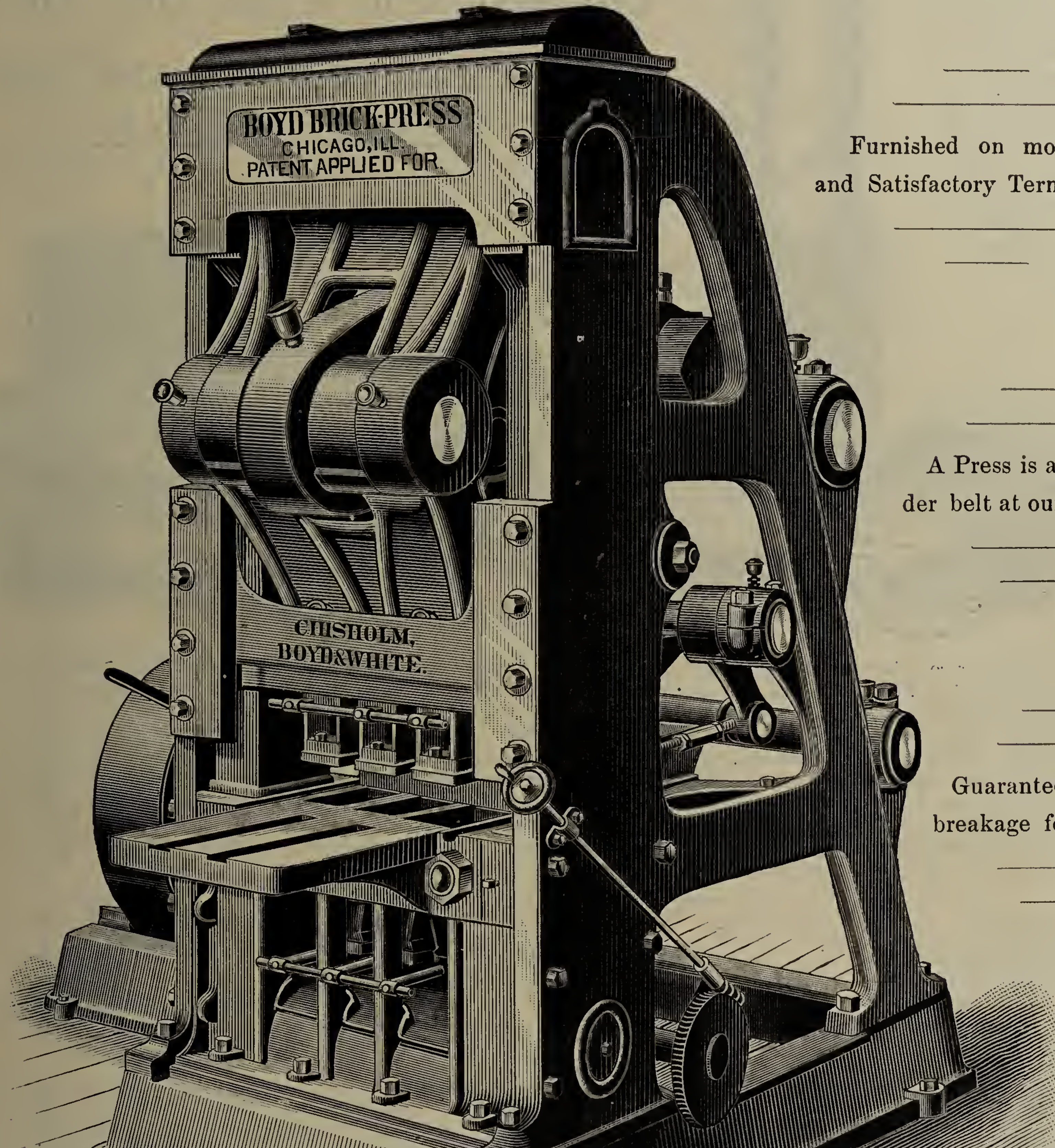
ANY NUMBER OF MOULDS DESIRED.


BOYD BRICK-PRESS
CHICAGO, ILL.
PATENT APPLIED FOR.
CHISHOLM,
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Furnished on most Liberal and Satisfactory Terms.

A Press is always under belt at our Factory.

Guaranteed against breakage for 2 years

☛ Write or come and see us.

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I. & M. WOLFF & COLEMAN

THE "IRON CLAD"

- Dries Brick and Tile with Exhaust Steam from Engine in day-time and Live Steam at night.
- Pipes Thoroughly Isolated in Iron Clad Box.
- Easily Accessible to Examine and Repair.
- Not Dependent upon Direction of Wind or the Condition of the Atmosphere.
- Features Radically Different from any other Drier.
- Is Broadly Secured by Bona Fide Patents.
- Buildings Not Expensive to Construct.

Patentees and Sole Builders

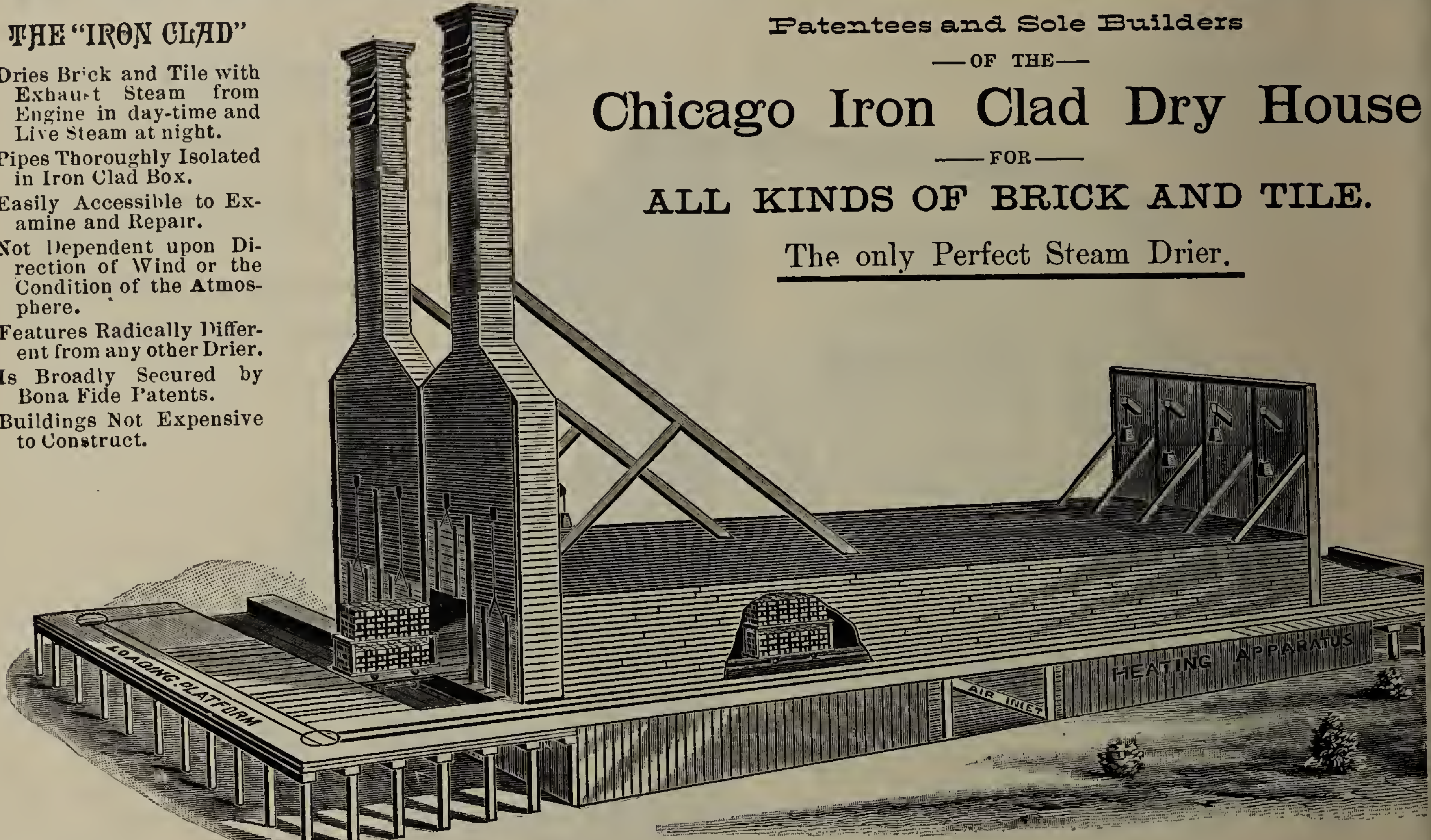
—OF THE—

Chicago Iron Clad Dry House

—FOR—

ALL KINDS OF BRICK AND TILE.

The only Perfect Steam Drier.



This Dry House is a combination of the Drying Floor and Tunnel System. The radiation from the Iron Floor extending over the heating coils dries the lower tiers of bricks. The perforation of the Iron Floor gives an even distribution of the heat and prevents cracking. The steam heat is not so intense as to melt down the bricks or bake them. The bricks are dried uniformly; they come out smoothly and burn evenly, with a good ring. The water-smoke is drawn off rapidly as made and the drying is even and gradual. Stiff mud bricks are haked on double deck cars and thoroughly dried in 24 hours. Soft mud bricks are dumped on pallets and cars carry the same through Dryer in 24 hours. Semi-dry and dry pressed bricks are specially provided for and can be dried without injury. We can convert other Dryers into our system, thereby improving product and capacity. Our buildings are constructed en-entirely of wood; are simple, cheap and easily erected. We furnish complete steam heating apparatus with pipes and connections, Iron Cars, Turn-tables, Transfer Cars, Rail and superintendence. Confer with us before contracting elsewhere. We will save you money time and trouble. State character of bricks made, name of machine used and capacity required.

W. C. McMillan, Pres.
Geo. H. Paine, Vice-Pres.
Richard H. Hall, Sec'y and Treas.
F H. Wolf, Gen'l Manager.

—OFFICE OF—
ANNA RIVER BRICK CO.,
120 Griswold Street.

Detroit, Mich., October 8, 8188.

Messrs. I. & M. Wolff and Coleman,
Chicago, Ills.:

Gentlemen—Yours received. We will cheerfully give you the following facts about the Iron Clad Brick Dryer you put up at our yard at Hallston, Mich. We have had some experience in Dryers and have looked into them very thoroughly; and can confidently say that the Iron Clad is the best we have seen. In the construction of the Heating Apparatus and in every detail, you have given us the best. The Iron Cars, Transfer Cars and Turn Tables are superior to any we have seen, being strong, well made and convenient to handle. Our Dryer with the loading and unloading platforms occupies a yard space of 101 feet long by 68 feet wide. The buildings are constructed entirely of wood, divided into 5 rooms and all under one roof. Our storage capacity is 140 cars. We have not yet been able to ascertain fully the amount of brick the Dryer will dry per day but from results obtained, are fully satisfied it will dry 50,000 brick per 24 hours. With stiff mud bricks, made unusually soft, we can put as many as 625 to the car and they will come out bone dry without cracking or marking in the slightest degree. Their surfaces are smooth, with well defined corners and all equally dried. They come out in splendid condition to set in kiln, and burn with a good ring.

We consider this qite a triumph in the drying of brick and attribute it to the arrangement of the Heating Apparatus, with the specially constructed perforated Iron Floor covering the same, allowing the heat to rise up gradually and lazily throughout the bricks.

The stacks pull out the water-smoke rapidly and the bricks begin to warm up as soon as they enter the Dryer and the drying is, therefore, gradual and the heat well distributed. We will take pleasure in showing the Dryer to Brickmakers and wish you success in your business.

Yours Etc., R. H. Hall, Secretary.

I. & M. WOLFF & COLEMAN,

PATENTEES AND SOLE BUILDERS,

Write for catalogue.

No. 102 West Washington St., Chicago, Ills.

The Best Is The Cheapest.

The following parties, fully appreciating the merits of a *first-class brick dryer*, have contracted with us and we are now building for them our

IRON CLAD BRICK DRY HOUSES

—AS FOLLOWS—

Corning Brick Works, Corning, N. Y.,
Daily Drying Capacity, 25,000 Stiff Mud Brick.

Jones & Clemens, Anderson, Ind.,
Daily Drying Capacity, 20,000 Soft Mud Brick.

South Baltimore Brick Co., Baltimore, Md.,
Daily Drying Capacity, 30,000 Soft Mud Brick.

Cleveland Brick Co., Wickliffe, O.,
Daily Drying Capacity, 30,000 Stiff Mud Brick.

W. D. Isaac, Charleston, W. Va.,
Daily Drying Capacity. 25,000 Stiff Mud Brick.

T. W. Stanland, Summerville, S. C.,
Daily Drying Capacity, 25,000 Stiff Mud Brick.

Carteret Brick Works, Carteret, N. J.,
Daily Drying Capacity, 30,000 Semi-dry Pressed Brick.

Anna River Brick Co., Detroit, Mich.,
Daily Drying Capacity, 50,000 Soft and Stiff Mud Brick.

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I. & M. WOLFF & COLEMAN,

CHICAGO, ILL.

DRYERS! DRYERS!
DRYERS!

FOR TILE, FOR DRY PRESSED BRICK,
FOR SEMI-DRY PRESSED BRICK,
FOR STIFF MUD BRICK,
FOR SOFT MUD
BRICK.

It will pay you to have your bricks thoroughly and equally dried before setting in kiln. You can dry them more economically in

THE IRON CLAD DRYER

Than in the kiln, besides getting a more uniform burn and better bricks. Handling and wheeling bricks costs money, and the bricks are often marred and in bad shape when they go to the kiln.

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I. & M. WOLFF & COLEMAN,
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THE CLAY-WORKER

VOL. XI. INDIANAPOLIS, IND., FEBRUARY, 1889. No. 2.

Written for the Clay-Worker.

EXAMPLES OF AMERICAN BRICK AND TERRA COTTA WORK.

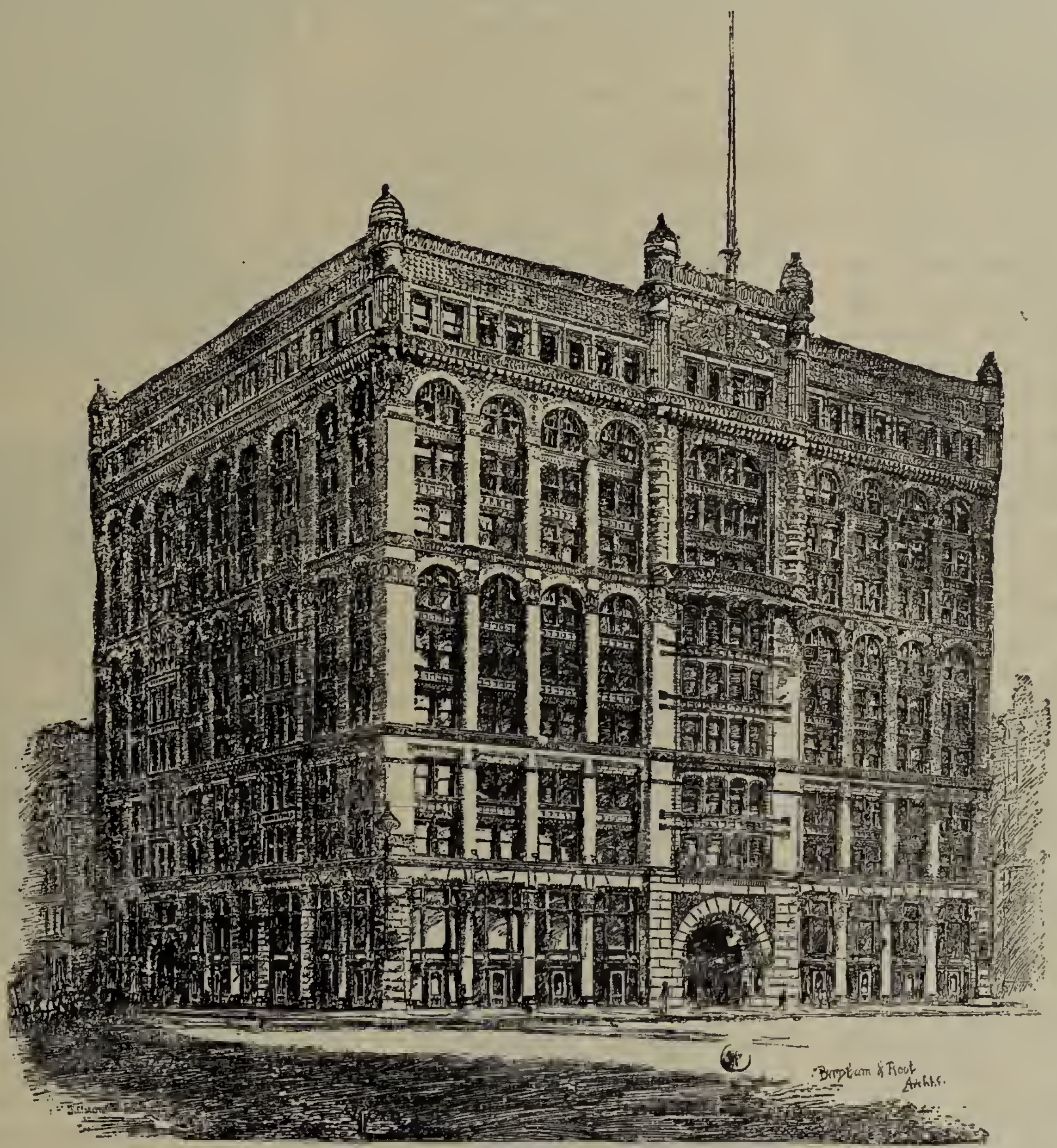
No. 13.

THE ROOKERY.

This building is among the most notable of Chicago's great commercial structures none of which are more deserving of attention from clay-workers.

It is one of the largest and finest office buildings in America and is located at the corner of Adams and La Salle streets.

The "Rookery," so called from the old city buildings which formerly occupied the site, was erected in 1886 by the Central Safety and Deposit Company, of Chicago, under the supervision of the architects, Mess. Root & Burnham, of that city.



THE "ROOKERY" BUILDING.

The ground covered is 167 feet 6 inches on Adams street by 177 feet 8 inches on La Salle street. It is eleven stories high, and 160 feet to the top of the cornice. Structurally, the exterior is granite for the first two stories, and reddish brown brick and terra cotta above. The main terra cotta work consists of carved panels on the continuous bay windows on both fronts. The general type of ornament is borrowed from East Indian forms without literally following any one example. The piers throughout are rounded from top to bottom, and all of the arches and lintels are formed upon the same radius, brick of special pattern being made for the purpose. Wherever terra cotta is employed it is designed in small blocks, which are bonded in with the brickwork. The constructional part of the building is thoroughly incombustible, all iron work performing any constructional purpose being covered with fireproof material, and the floors laid on hollow tile, as usual in large office buildings. Any iron mullions in windows or elsewhere about the building which are exposed serves no constructional purpose. The principal feature of the interior plan is a central court, in which the utmost care is taken to make the most finished effect, as well as produce the greatest possible amount of light. This court is open from the top and is about 75 feet square, with offices facing all around. The walls of the court are English cream-colored glazed enameled brick, with glazed terra cotta ornamentation. All the wrought iron work in the court is finished by the Bower bath process in gold bronze. The lower portion of the court is roofed over five feet below the second story windows, the space thus enclosed being finished in white marble and plate glass. In the general finish great stress is placed upon the detail and size of the entrances and vestibules. These are finished in polished white marble and onyx. A grand staircase leads to the court gallery, this being finished in the same material.

ORDINARY bricks are about eight inches in length, and with the mortar joint about half that in width, so that each brick on the flat will give a horizontal surface of about thirty-two square inches, or 4½ bricks will cover a square foot. As ordinarily laid there are nine courses to every twenty-four inches, or 4½ to the foot. Four and a half courses with 4½ bricks to the course gives 20¼ bricks to the cubic foot. Waste, cutting and closer joints will easily require an allowance of twenty-one bricks per cubic foot, which will be found a very convenient figure for estimating the number of bricks required for a wall of a given size and thickness, and it thus becomes unnecessary to find the cubic contents of the wall, but merely to multiply its face area or the product of its length and height in feet by seven-fourths of its thickness in inches, which, as the thickness is always some multiple of four inches, is a very simple process.

Written for the Clay-Worker.

HINTS ON BRICKMAKING.

No. 33.

BY "R. BRICK."

A friend once asked me what trade I was learning and I said, "Brickmaking." He replied, "Why, I didn't know there was any trade about that business. I thought any person could make bricks." This is a popular fallacy, nevertheless it is this mistaken idea among the uninitiated that is one of the chief causes of low prices of brick; also an explanation of why so many bricks, or things called bricks, are put on the market, and when laid in a wall make a thoroughbred brickmaker blush for his calling. Just for the reason that people imagine that a brick yard can be run like turning a crank.

Some enterprising but misguided citizen that can get a blind horse, an upright box with a wooden shaft set on end in the middle, with wooden pins driven into it, a distorted tree hung sort of horizontally across the top of this wooden shaft, with a singletree hung on the end of the said distorted tree, which is then called a "sweep;" to this is attached the blind horse referred to above. Some "loam" is brought to this "masheen," as "any person can make a brick," "any kind of dirt will make a brick," the loam is thrown into the concern, the blind horse which cannot discern is led around a few times until he can see the way and go it alone. As the loam passes down through the wooden pins it is agitated pretty thoroughly by the time it issues from the bottom of the "masheen;" somebody is there ready to seize it and plunge it into a mould, another chap bears it away in triumph, turns the mould bottom side up and shakes the thing out upon the earth. It is now an *alleged* brick, and another and another is laid beside it until there is a row across the yard. Then we behold a brick yard in full blast.

> The blinded horse goes round
> Till the mass of clay be ground,
> And no weary arm is folded
> Till the task of bricks be moulded.

The new fledged proprietor views the thing with much satisfaction and says to the spectators, "I told you any one could make bricks,"—poor fellow. These bricks when dried are piled up in a pile called a kiln, a skin of unburned bricks is wrapped around them, fire is placed under the kiln, and all the wood on hand is shoved into the thing, then the rails from adjacent fences follow, to get up an extra heat to make them "cherry red." The N. F. B. M. informs the burner that all the wood, as well as available rails are burned, hence it is his opinion that the bricks must be burned "cherry red," in fact they looked "cherry red" on top the previous night. The arches are "daubed" up for the last time and the work is finished. The next morning a red hot brick is taken from the top of the kiln, it is thrown to the ground and quickly covered with sand, and left there several *minutes* until cool. It emerges from the sand bath looking quite blue and as full of checks as a baggage room. It is pronounced first rate, kiln burned "cherry red" to the platting, (this he has learned from some sure enough brickmaker). When the kiln is opened the bricks are all a beautiful yellow in color.

There is just one good point about this burn, and one so much sought after by all of us, it is uniform in color—all yellow; uniform in hardness—all soft. Our N. F. B. M. concludes it is not exactly red "cherry red" but rather a yellow "cherry red," and he gathers together more wood and fires again, determined to make it hard this time. The result is, the arches are all melted or broken, still a large crop of yellow "cherry red" and a few thousand sure-enough "cherry red" in the center. He has now spent considerable money and must realize on these bricks; they will not bring the regular market price, he offers them at a reduction.

Here the "Comedy of Errors" makes itself felt among the brickmakers, for people think one brick is as good as another, for if anybody can make brick it follows that they will think that anybody's brick are as good "as any other body's."

We are perhaps partially to blame for this state of affairs. Many of us are careless as to the quality of the bricks we produce, careless as to their handling before and after they are burned. We should prepare the clay better, see that the bricks are perfect in shape and well-burned, giving them strength and beautiful color, so that when they are properly laid in the wall the structure will be "a thing of beauty and a joy forever."

The contrast between these bricks and those made by the amateur "dirt dauber" will be so marked that even the "street gammons" will take up the subject and discuss it.

Let us make bricks so attractive that the public will conclude that it takes a brickmaker who has spent years of time and labor, observation and thought, to manufacture a brick that is a brick.

The annual coming together of progressive brickmakers at the National Brick Manufacturers' Convention will do more to bring about the desired result than can anything else. Once a a year at least we are proud that we are brickmakers, and why should we not be proud? The very bricks we are manufacturing will be utilized by the human race through all time to come. They are as durable as the granite hills of New England.

Written for the Clay-Worker.

POTTERY.

The worker in clay was the historian of the ancient world, as well as a contributor to the greatest share of its domestic comfort. The first rude utensil, after the flint arrow or spear point, was the primitive pot of baked clay, that enabled pre-historic man to prepare the fruit of the chase or field. Its use, in higher or lower stages of development, has been universal, from the African negro and American Indian to the ware of Sevres or Japan.

The higher civilizations have grown, the more extensive and various has the art progressed. Indeed, our improvements have come more through our extensive knowledge of chemistry, the improvement of the glaze, and the expansion of the list of fire colors, than through an improvement in model or plastic decoration, in which the ancients displayed a perfection that has left for us little beyond imitation.

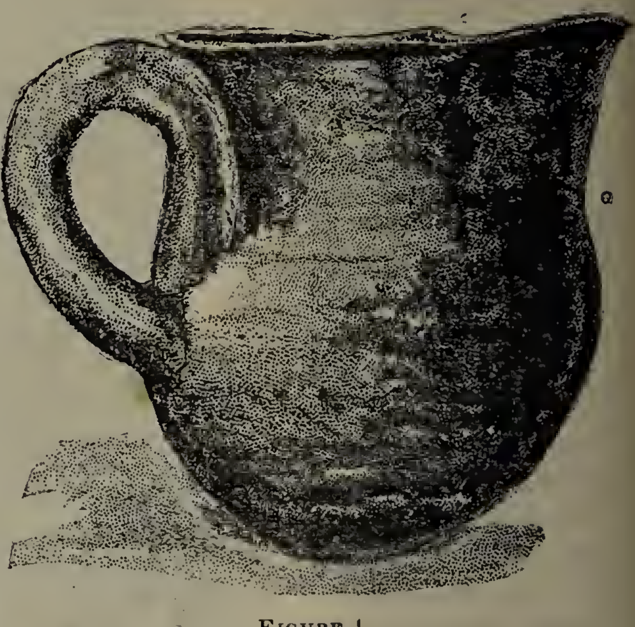


FIGURE 1.

The same is true of architectural decorations and of art objects; and if we consider the antiquity of Chinese or Japanese art—an art that is modern only in the sense that the races who practice it escaped the wrecks of the ancient world, but where art itself is of unknown antiquity—we may safely answer that beyond merely mechanical improvement of methods and cheapening of products, we have yet much to learn from the past.

The Chaldeans and Egyptians were the most ancient whose records in clay have come down to us. The latter developed the highest and most beautiful forms of domestic ware and articles of *vertu*, while the former developed its architectural capacities to a degree where we are just now imitating with such happy effects. This divergence in development by two ingenious races was probably due to variations in the conditions imposed by the materials each found most ready at hand. The Egyptian genius did not seek architectural expression in terra cotta, owing to the abundance of excellent stone. The Chaldeans, on the other hand, depending upon the clay deposits of the Messopotamian plains, were compelled to extend its use to the utmost; and with this material they embellished their edifices with a gorgeous diversity of form and color that we are now only beginning to appreciate and utilize.

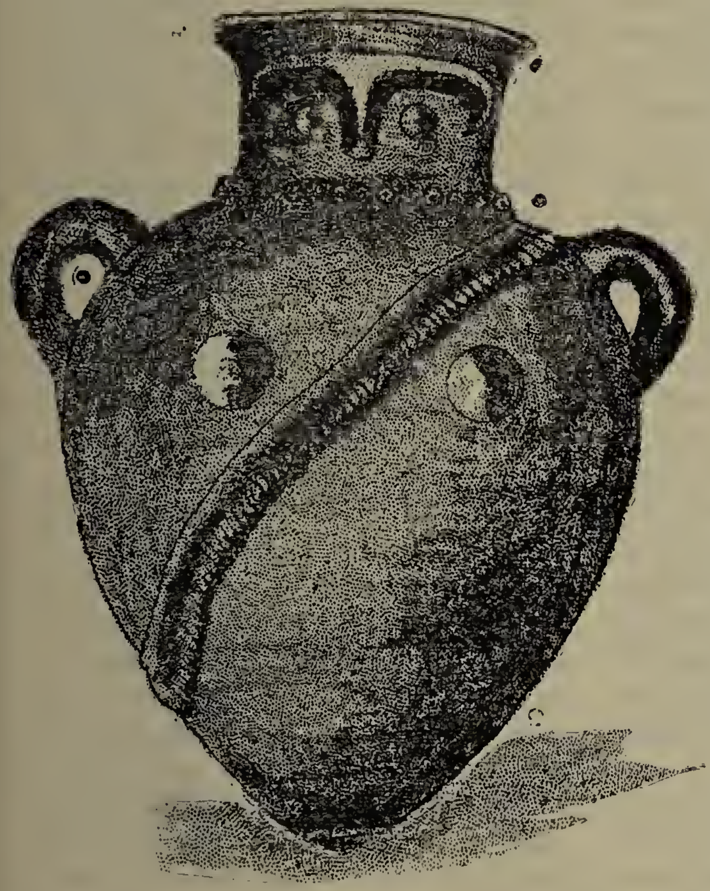


FIGURE 2.

Further in the course of these papers we will present many illustrations and models drawn from these sources, to evidence the truth of these assertions. But at present we will confine our remarks to domestic utensils and art subjects.

The latter were almost universally religious in character. In those days there was no such thing as art, as we now understand it, as a sentiment separate and distinct from religious or warlike instinct. It is to this fact that their inspirations and conceptions held a relation to the great truths of human nature so strong that no mere art can break away from them; and hence our conception, lacking in passion, is only mechanical reproduction of forms, or slaves adherence to their conceptions. Their religious instincts conceived their idols in forms of ravishing beauty, and the artistic expression resulted in an art equally beautiful, free and natural. We are following in their footsteps, because we have not improved upon their moral ethics, and because the ancient artist, in following a natural instinct had unconsciously drawn from the great fountain of truth.

I have emphasized these points because a more thorough study of the ancient standards is necessary for the general improvement of our own, and to assist in awakening a more general interest in the work men have already accomplished.

The illustrations presented in this issue are all specimens from the ruins of Troy. They represent a depraved phase of Egyptian art, as translated through Phœnician source. While the execution is rough, as would be expected from mere novices the suggestions of form are artistic and show the impress of their Egyptian origin. Figure 2 is a vase with the owl-headed Minerva, drawn with the same brutalized conception of the attribute of wisdom to be expected from a people who still immolated children on the altar as a religious sacrifice.

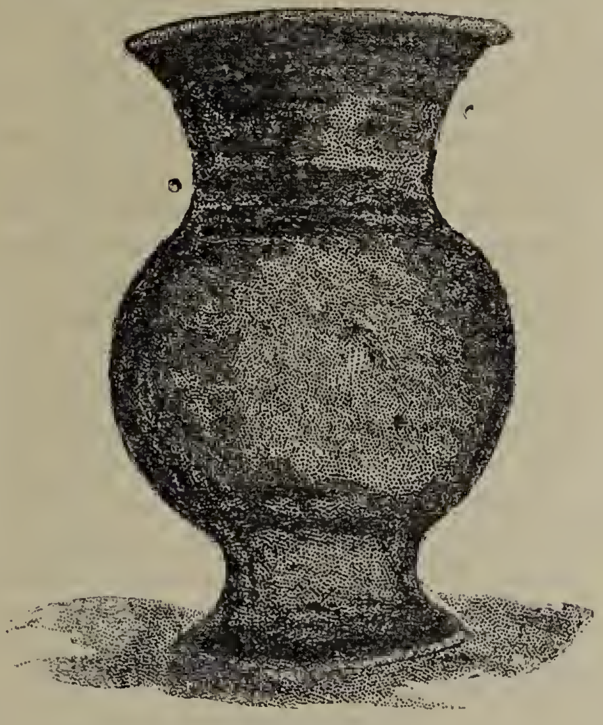


FIGURE 3.

It will be seen by anyone who will recall the majestic Minerva of Phidias, how wide is the gap between the civilization of the Trojan era and age of Greek culture. A vase of the age of Pericles and the one represented in Figure 3 shows the development of the human kind in the most indelible characters, and discloses a gap made greater in so far as development is concerned, than that which separates us from Alexander the Great. In fact, the only departure during this great interval was developed by the gloomy Ecclesiasticism of the middle ages—a period, however grotesque its conception may have been, certainly impressed the strong individuality that always follows the passionate enthusiasm that is the basis of all real expression in art forms. Its decadence was due to the fact that it portrayed the life of demons and angels, instead of human nature common to men in all ages.

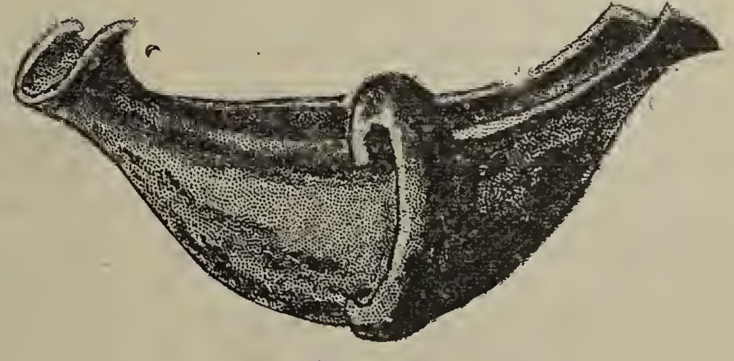


FIGURE 4.

A BLOW AT THE TRUSTS.

The legal mind of America has perhaps been devoted to no line of study more closely in the last few months than to discover some way of checking the rapidly growing power of trusts. Judge Barrett, of the Supreme Court of New York, has made a great step in solving this difficulty by one single decision. It is understood that trusts have no legal status; that is, have no responsibility to the state, and cannot sue or be sued. Corporations merged into these vast organizations virtually drift away from the basis of their formation, and, in turn, manage to evade much of their legal responsibility. The learned Judge decides on this ground that a corporation, the standing of which was in question in a case before him, had forfeited its charter, and gave an additional reason that the profits of the trust combination were not distributed, on anything like the basis of the capital stock of the corporations of which it is formed. If the opinion of Judge Barrett in this matter will hold, a strong and most effective weapon for fighting the trusts has been placed in the hands of the American people. If corporations are to lose their existence and franchises immediately on becoming connected with trusts, the days of the trust iniquity would be numbered—a consummation most devoutly to be wished.—*Ex.*

Written for the Clay Worker.

THE MANUFACTURE OF TOBACCO CLAY PIPES.

BY CHARLES T. DAVIS.

Very few know that nine-tenths of all the clay pipes manufactured in the United States are made in Brooklyn and yet such is the fact. Over 15,000 gross of clay pipes are annually produced by the three factories located in that city, which together employ thirty hands or an average of ten each. A visit was made to the largest of these factories, which is situated on Kosciusco street, near Broadway, and which is run on the co-operative system, being the result of a combination of several small manufacturers, who found that the profit on the goods was too small to allow of much competion. Probably less than one person in a thousand know how the clay pipe is made.

The clay used in the manufacture of the common pipe is obtained from Woodbridge, N. J., and costs at the pit $2 per ton. With freight and cartage added, the raw material costs delivered at the factory $5 per ton. The clay obtained at Woodbridge is said to be superior for pipemaking to that obtained in Dorsetshire and Devenshire, in England, as it is more absorbent, and therefore more healthy to the smoker. A fine bed of clay is also worked to some extent at Glen Cove, L. I. The clay, after being delivered at the factory, is allowed to stand in the sun for a few days to become seasoned. After thus being exposed sufficiently long it is mixed with water and "milled," the process consisting of running it through a mill which crushes it and removes all grit and foreign substances. After coming from the mill it is worked and kneaded by hand, much in the same manner as bread, and whatever grit remains is carefully removed. Great care is taken to have the clay of the same consistency throughout as otherwise the pipes would crack and become spoiled under the test of the kiln. When the clay has been worked sufficiently it is given to the "Roller," as the man who fashions it is called. His tools are the simplest, a wooden bench, a stool, a rolling-board, and his hands constituting his "kit."

The clay is placed on the right hand of the bench, in easy reaching distance of the workman, and then the second process of pipemaking is gone through. Grasping a handful of clay the workman separates it in halves and placing them on the board rolls them, one with each hand, until they have reached the length desired one end, of which the bowl is made, resembling a small sized pear. When it is remembered that only about one ounce of extra clay is allowed for each dozen pipes rolled, it will be seen how difficult it is to grasp just the exact amount necessary for each pipe from the pile of clay without calling into requisition the aid of scales. After being rolled the partly formed pipe is laid on a board just the length of the pipe desired, when if the stem is too long it is broken off at the required length.

After one dozen pipes have been rolled in this fashion, they are bunched and passed over to the helper, who sits on the opposite side of the bench, on one end of which is the machine with which the pipe is made. It consists of a lever, at the lower end of which is a plunger, the size of the bowl of the pipe to be made. Below the plunger is a slot in which the iron mold is placed; the slot allowing the mold to enter until the bowl of the pipe is directly underneath the plunger. When the half made pipes are handed to the man at the machine, he picks up the bunch in one hand dipping the other in oil with which he oils the clay, separating the bunch as he does so. After oiling the clay he picks up the iron pipe mold, which is double, separating at the center, and opening it he dips his finger in oil and with a quick movement oils the mold, which from constant use shines like burnished steel. The mold is the exact size and shape of the pipe. After the mold is oiled the workman picks up a long steel wire, and, oiling it, proceeds to insert it in the stem of the pipe, pulling the clay on in about the same manner as a glove is put on the hand. After the wire has been inserted nearly to the bowl portion of the pipe, the clay is placed in the mold, which is then closed and placed in the slot of the machine, care being taken that the wire in the stem does not reach to the bowl, as, if it did, the plunger which forms the bowl would break it. The mold is pushed as far as possible into the slot of the machine, care being taken that the wire in the stem does not reach the bowl, as, if it did, the plunger that forms the bowl would break it. The mold is pushed as far as possible into the slot, and while being held there with one hand the workman turns a screw at the side of the machine, with the other hand forcing an iron plate against the mold, the pressure forcing out all superfluous clay and forming the pipe. The lever to which is attached is then lowered, the plunger entering the bowl portion of the mold forcing out the clay and making the bowl. The mold is then withdrawn from the machine, the wire in the stem being forced into the bowl of the pipe making the hole through which the smoke is drawn. The clay which has been forced out of the mold is then cut away with a knife and the pipe removed from the mold and placed upon a tray. In some of the machines used, a knife is attached to the lever, the superfluous clay being cut from the mold as it is removed from the machine. It is an American invention, but owing to the fact that it does not always work smoothly it is only used upon the more common pipes. The wooden trays when full are placed in the sun to allow the clay to dry moderately. They are then taken by a girl and each pipe is carefully polished with a piece of hard wood. A "rimmer," a block of hard wood is placed in the bowl and turned round to smooth the bowl, while a piece of iron attached to the "rimmer" cuts the wreath on the outside of the bowl. The stamp that is seen on the front side of the bowl is then put on by means of a hand stamp, and the pipe is ready for the "potter," another girl who places the pipes, bowls down, into an earthen pot called "saggers," which after being filled with pipes, is covered with a flat earthen cover and placed in the kiln. The clay before being fired is of a slaty blue. The various decorations, such as wreaths, fern leaves, figures, etc., seen on the pipes are formed by the mold. After the kiln has been filled with "sagger," containing the pipes the door is closed and the fire built. The fuel used is charcoal and coke, and the fire is kept at a white heat for twenty hours, the heat entering the kiln by means of flues. Great care is taken not to allow the flames to reach the white clay pipes as the slightest touch of fire would blacken them. After remaining in the kiln the required time the pipes, which by that time have become perfectly white and hard, are removed and allowed to cool, and are then carefully examined and placed in boxes and barrels ready for shipment. The clay pipes, the pipes of which are colored in imitation of smoked meerschaum are made in the same manner excepting that the fire is allowed to reach them in the kiln—the color being obtained from it. The white clay pipes which look like new meerschaum are made so by being varnished.

The factory visited makes about fifty different styles of pipes at present, and can make as many as the ingenuity of man can suggest by means of molds. One style of pipe was of red clay obtained from Maryland in the form of a head and that head representing the famous Brooklyn divine, Rev. Dr. Talmage. The mouth is used for the bowl of the pipe, the neck being utilized for the stem. The demand for this style of pipe was very large for a time, but none are manufactured now. Various other curious styles were seen, one a bust of Garfield, which proved a total failure on the market.

A Farmer's Comparative Gain From Using Tile.

BY D. O. LOY, MONTICELLO, ILL.

I was walking one day with Farmer Jones,
Over a section of land he owns,
It was in the fall, as I remember,
About the first of last September.

His harvest was over and threshing was done,
And plowing for wheat had just begun,
The furrows were all as straight as a line,
And I noticed the ground broke mellow and fine.

While crossing over a stubble field,
Mr. Jones was boasting about his yield,
Of wheat and oats of barley and rye,
On land that never before was dry.

"Three-fourths of this section was nothing but slough,
Which never got dry enough for to plough,
While the rest of my land was tougher than wax,
And the whole farm, sir, wouldn't sell for the tax.

"I could raise some corn, when we had dry years,
But I always raised more nubbins than ears;
Then I tried sowing a few acres of rye,—
But, sir, it didn't grow more than knee high.

"There was no use trying, I couldn't raise wheat,
So the whole blessed year I had corn bread to eat;
I made my garden where it seemed to be rich,
But my 'taters' and onions would rot in the ditch.

"I tried raising stock—some cattle and hogs,
But they'd sink out of sight in my sloughs and my bogs;
Besides, raising hogs was no profit to me,
For they'd get sick and die with the hog cholere.

"Then Maria and the children took down with the chills,
And I spent all my money for quinine and pills;
About that time, sir, I felt mighty blue,
For Maria did washing to help me pull through.

"My health had been good for in fact as a rule,
I had a constitution as tough as a mule,
But, sir, you can see I had reason to kick,
For such luck as I had would make a mule sick.
"At last my old bones began for to ache,
And, sir, my whole carcass would shiver and shake,
Then I took the fever and was confined in bed,
And I wished the whole family of Jones' was dead.

"To pay off my mortgage I knew I must fail,
So my section of land was put up for sale.
But no one at the sale would make the first bid,
For the whole of the farm under the water was hid.

"And the mortgagee even a deed wouldn't take,
For he said he could never make use of a lake,
He released the whole mortgage and gave it to me,
Saying, 'Swim to your shanty your title is free.'

"I'll pledge you my word, before tiling was laid,
On the whole section, sir, not a dollar was made;
The low ground was too wet, or the high ground too dry,
And I always had feed for my horses to buy.

"Until old neighbor Clark decided to tile,
With his outlet through my land for over a mile,
So I tried planting crops on each side of the drain,
And I found I could raise just a plenty of grain.

"Then I commenced tiling, at first rather slow,
For my income was all from the crops I could grow;
Until now, sir, my farm has s plenty of drains,
And I just sit in the house and laugh when it rains.

"And now this whole section of land is my own,
I am all out of debt and have money to loan;
That I raise splendid crops, sir, no one can deny,
Though the weather be wet or the weather be dry.

"Just look at my horses, hogs, cattle and sheep,
All feeding on clover that's more than knee deep,
Take a glance, if you please, at that herd of swine,
Did you ever see hogs more healthy than mine?
"Climb over the fence and examine my corn,
Did you ever see bigger ears since you were born?
And look at the pumpkins all over the ground,
And squashes, sir, that you can't reach around.

"Now we'll go to my granary and examine my wheat,
Which grew on this stubble right under my feet,
And this very field, sir, I would have you to know,
Was a deep, muddy frog pond where nothing would grow.

"Just two years ago I could get in a boat,
And all over this fine stubble field I could float,
But now you can see the result of tile drains,
And readily count my comparative gains.

"And now in my garden, sir, everything grows,
Till they crowd each other clean out of the rows,
Just pull up a potatoe vine, sir, if you will,
And count the potatoes that grow in a hill.

"I've tiled every pond, and I've tiled every slough,
And I have tiled every foot of my high ground too;
I don't care a cent for the money it takes,
Since our whole family are cured of the shakes.

"No family on earth now has better health,
And it is plain to be seen I am gaining in wealth;
My children, sir, they just 'do it up' brown,
For they go with the tony young people in town.

"By using drain tile I am free to acknowledge,
I am sending my boys and my girls off to college;
And Mariah, she's visiting friends in New York—
I am the wealthiest farmer that lives on Lake Fork."

But, said I, Mr. Jones, some people deny,
That tiling's a benefit when it is dry:
I have heard that a man who lives in Champaign,
Said, if we didn't stop tiling it never would rain.

"Yes, I heard that too," the farmer replied,
"But I knew for certain the fellow had lied,
For notwithstanding what he said in that card,
All last spring and summer it rained just as hard."

"It surprised me to see from a man of his rank,
A letter that seemed to be written by a crank,
But we'll not hear again from a pen or a mouth,
That drain tile have anything to do with a drouth."

"For," said Mr. Jones, "you plainly can see,
What use of drain tile has accomplished for me,
During seasons of drouth and seasons of rain,
One hundred per cent. is my comparative gain."

TAKING NO CHANCES.—Groom—(to bride; they are waiting for a minister)—Hadn't I better skip out and see what is the matter, my dear? The minister should have been here twenty minutes ago." Bride—"No, George; you stay right where you are,"—Harper's Bazar,

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Read before the Illinois Tile & Drainage Association, January 21, 1889.

Written for the Clay-Worker.

AFTER ALL BRICK IS THE BEST.

BY J. F. ELSOM.

Since my return from Memphis where all was of the brick brickey, I have had sundry physical examinations to make of material designed to supercede brick in the construction of buildings, one of the very latest candidates for architectural favor being blocks in the form of bricks, made from the refuse or offal from blast furnaces, in other words "slag," but more of this anon when the tests have progressed sufficiently for one to base an opinion. Again, the services of this laboratory have been brought into requisition for deciding the relative values of brick as compared to iron, steel, and stone as fire-proofs, particularly for ornamental fronts, pillars and palisades. One in particular is the case of a frightful accident resulting in two deaths and an alarming loss of good property in a collapse occurring a couple of years ago. I have yet to see, and I have been in constant practice nearly twenty years, any material that, all things considered, will withstand the onslaught of extensive fires equal to good brick, the experience in Chicago and Boston proves this conclusively, and notwithstanding the fact that iron, steel, granite, etc., presents a much greater crushing strength than our ordinary brick, it has been shown during great fires that two buildings in every way equal so far as exposure to the heat was concerned, one constructed entirely of brick, the other with iron posts, pillars and window casings the former will stand until completely gutted by the fire before the walls will totter and fall, in many instances not falling at all even after the interior is burned away, while the latter will often fall before the flames have reached it, the iron bending, twisting and otherwise distorting sufficient to allow the superincumbent mass to fall for lack of support by the heat generated by the fire of an adjoining building, and if of granite or stone chipping and cracking until like causes produce like disastrous results.

I have been told by old and experienced firemen that during the progress of extensive fires it was always safe to allow the men to work around brick buildings presupposing them to have been well made of good brick—as long as they could for the heat but with buildings wherein iron and steel entered largely into the construction especially as supports even approaching a burning building was always accompanied with danger from the building collapsing.

Insurance companies also recognize the reasonableness of the theory and efficiency of these conclusions. As a rule their rates are lower on solid brick than mixed structures, and accident companies draw deep dark lines between the two when they write policies covering each loss separately, and insurance experts have long since decided that a building constructed largely or even entirely of iron is not necessarily fire-proof.

Iron, when heated, bends very readily, when under very light pressure, and cannot be considered of itself fire-proof. I am forced to admit as the results of experience there is very much to be said in favor of iron as a building material. It prevents fire from spreading and unless there is a large amount of inflammable material in reach of the flames, there is little danger of the fire itself making much direct headway amidst a mass of iron, but I am not speaking of direct burning but the results of the burning of other substances sufficiently near to heat the iron.

Returning to granite and other varieties of stone, any of them is little if any superior to iron as preventing these indirect results of fire, hence, for these reasons alone brick stands at the head as a building material. What though brick itself presents a comparatively low crushing strength as compared to iron, steel, etc., a very silly argument presented in their favor. But does not every single brick in a properly constructed wall bear its own weight? And to make them doubly, aye, tripley strong in this respect, are not the joints broken in every conceivable manner as the walls are built.

Brick has passed through many firy ordeals and stood apparently unharmed, long after iron, steel, and the hardest rock have succumbed, burying almost countless millions in its debris which with brick could have been largely saved. Cast iron is not homogeneous enough, is not solid enough, wrought iron though an improvement is but little better. For a strictly fire-proof building, in purpose as well as intent, there is not a material known in chemistry that stands ahead of well made brick.

Small Clerk—"Fader, a shentleman in de store vants to know if dot all-vool, non-shrinkable shirt vill shrink?"

Proprietor—"Does it fid him?"

"No, id is too big."

"Yah, id will shrink."

CORRESPONDENCE.

These columns are open to all. The full name and address is required but will not be published except when permission is given by correspondent. Those desiring to communiacte privately with any correspondent whose full name is not given can do so by addressing letters care of Clay-Worker.

A Ramble Round Kansas City Brick Works.

Editor Clay-Worker:

According to promise I send you a few notes of what I saw among the clay workers of this city. Dry press process takes the lead. The most noted works are those of the Calorific Brick Co. They operate two very large and powerful hydraulic presses, which make a first-class brick, but the high price of this machine puts it beyond the reach of any common man. Each machine presses ten brick at a time and makes 40,000 per day. They are taken direct to the kiln and set 40 high and burnt in Wingard kilns. Their works are in the city and as their clay was running short they purchased a tract of land about ten miles out, where they have sheds for housing clay in large quantities. It is plowed, rolled, winrowed, and then taken into the sheds by scrapers and teams where it lays fully four weeks before being shipped to the works for manufacture.

Close to the above yard is that of Messrs. Underwood, who use two "Lion" presses for their dry process, and a Martin machine for soft mud brick, which are dried on pallets on racks. The two presses turn out about 20,000 each and the Martin about 30,000. They burn in permanent clamps with grate bars of about 8 feet in length to each side, set 40 high of which the top five or six courses are mud brick, and as the latter takes much less fire than the dry press brick, they consequently get very uniform burns.

Further on I visited the yard of Messrs. Norcross Bros., the contractors, who are engaged on an immense eleven-story building for the New York Life Insurance Co. They use a Chambers and also a Little Wonder which are both turning out good stiff mud brick, and burn in a Morrison open kiln, and also in a Radford Continuous kiln. I am pleased to say this is the second continuous kiln that I have seen working successfully in the United States.

There are several other yards near those already mentioned which are principally making by hand, and which I had not time to inspect, but it is only a question of a short time now when the old hand yards will have to move out of the city limits as the clay is being worked out and the land is too valuable for building purposes.

Across the Kaw or Kansas river I came to Wyandotte, now called Kansas City, Kansas, which is connected to its sister city by numerous fine bridges, for wagon, cable and railroad, including the Elevated and also the Wyandotte & Northwestern Railroad. The latter is yet in its infancy, but the business already being done through the large and populous country will insure its soon becoming one of the first railroads of the state. This railroad runs through a tract of land abounding in large quantities of clay which underlies the top surface to a depth of 50 feet, and which is suitable for almost any class of clay manufacture.

The first place I visited on this road was the works of the Gregg Brick Manufacturing Co., a mention of which appeared in your last issue. They have just lately started grading and laying in foundations for machinery and kilns. Two of Gregg's celebrated machines have just arrived and will be put in place in a few days and they expect to have brick on the market in a short time now.

Next along the railroad I came to the works of the Whittaker Brick Co., This company has been running about twelve months. They operate three of Whittaker's Semi-dry machines. Their clay is of a very fine texture. It is easily dried, and after being turned over with a cultivator it is brought into large dry shed for use as required. The clay taken from the shed is first run through a Williams & Co.'s "Cyclone" Pulverizer, which reduces it to a very fine powder. From here it is taken up by and elevator and dropped into a revolving screen, which separates any lumps or foreign matter which may have gone through the pulverizer. From the screen it drops into a mixer, which carries it to the chutes which feed the brick machines, which make it up into a perfectly square and true brick ready to set direct into the kiln. This company have lately built a continuous kiln from the plans of R. R. Gray's patent, and which at the time I saw it was turning out good hard brick. They also have two large open clamps. A mile further on is the station of Bethel, where a brick and terra cotta works has lately been established, but which at the time of my visit had only burnt two or three kilns by way of seeing what their clay would produce. This company propose building large works for the manufacture of architectural terra cotta, and is, I believe, an offshoot of the Northwestern Terra Cotta Co., of Chicago. This completed my ramble, with which I was very much pleased altogether. A. R. BATLEY.

A Letter from England.

Editor Clay-Worker:

We are making brick on the semi-dry plan. Our clay is a shale, and we call it "knots." It grinds easily in a perforated bottom pan and makes direct into bricks, without any drying, mixture, etc. The bricks are set at once in the Hoffman kiln, i. e., directly they leave the machine. Within ten minutes the knots are in a natural state in the pit, ground in a pan, made into bricks, pressed and set in Hoffman kiln ready for steaming and burning. Our bricks for labor, engine power and coal, cost about 7 shillings ($1.67) per 1,000, i.e., bricks (after burning) 9x4¼x2⅝. This does not include rent rates, wear and tear, supervision, clerks, etc., but simply all labor in the yards and coals for kilns and engine. There are ten yards here, and if we are all in full work could turn out 250,000 bricks a day.

The bulk of the bricks go to London by railway. We had a very wet seaton in England during the past year. The brickmakers in Kent, Essex and elsewhere, who make plastic bricks for the London market, have been stopped over and over again by the weather, and their output reduced many millions, while we who make semi-dry bricks and can make in all weather, have not has as good a season for several years past. At this time of the year we generally have between us some ten millions of brick in stock to supply the spring demand, while now we hardly have any and our demand exceeding all we can make. Several of us had heaps of second bricks in stock, which under ordinary circumstances were in a great measure unsalable, but all of these are now gone, the builders have cleared us out of good and bad alike. As a matter of fact, speaking broadly, there are no bricks at the present moment unused in England. Of course you could find a million or two here and there, but in comparison with other years there are practically none in stock. We have raised our prices two or three times within the past few months, but still the demand exceeds the manufacture. We used to make plastic bricks very extensively, but semi-dry is fast taking the place of plastics. The reason is—semi-dry can be made so exceedingly cheap, and there is no loss by exposure to weather. R. S. BLINK.

Petersborough, England,
January 4th, 1889.

Wants to Know How to Burn With Gas.

Editor Clay-Worker:

I have been noticing the Clay Worker to hear some one say something about the use of natural gas in the buring of brick, but I believe I have failed to hear the subject mentioned. I had expected to hear it discussed at Memphis last month, but nothing was said. I would like to have some one who has been using it say something through your journal as to its success or failure. We have the largest gas field in the United States at Noblesville, Ind. Gatts & Nelson, who have been using it in temporary walls, have not been successful. It is the cheapest fuel in the world; gas may be had at from 10 to 15 cents per 1,000.

JOHN LAWSON.

Burning Glazed Ware.

Editor Clay-Worker:

"F. F. C.," of Harrisburg, Pa., complains in the November Clay-Worker that his ware is smoked in cooling off. Probably a kiln of stone ware can be smoked in cooling off, even if the burning has been faultless, but if it is smoked in burning it cannot be cleared up in cooling off. Bright trial pieces are not an infallible indication that the ware is the same. We have seen clay smoked somewhat similar to his in Southwest Missouri. The clay previously in use burned nice and bright without any difficulty. but wishing to change to a new bank a small quantity was used in the old clay as handles, and it burned still brighter. Next a few butter pots were made of it and the burned to a lighter color than the remainder of the kiln. This was considered such a satisfactory test that the next time the kiln was filled with it. The trial pieces continued to indicate that the color was all right, but when the kiln was opened—lo, and behold! it was "black as your hat." Here was a mystery for solution. The clay was superior in every way except that it burned to a dirty brown color, and on some pieces a thin film of something—clay, salt-glaze or ashes—raised up rough and wrinkled about one-sixteenth of an inch from the solid body of the clay. All efforts to improve the color in cooling proved fruitless.

Finally, an accident happened which threw light on the difficult question. When the kiln was nearly done an arch came down in the doorway (up-draft kiln), and with it a stand of small ware. As soon as the door was opened to put in a fire, the rough scum immediately appeared. Here, then, was a solution to the mystery—too much cold air. By shutting off all draughts of cold air through the fire-hole this clay burned to a good color when the crown-holes were sufficiently open at the same time to give a good draught. Therefore, if the ware is smoked by cold air in cooling off, we would suggest that he keep the grates covered with the remains of the fire, the doors closed and the damper up. Let the kiln cool in this way to a light cherry red, and then close up as usual.

In nine cases out of ten the fault is in the burning. It has been my experience, and I think the majority of burners will agree that any condition or circumstance which has a tendency to produce a smothered fire will almost invariably give a dark color to the clay. Extended experience, observation and experiment with different varieties of clay has established the fact that the smothered flame of imperfect combustion not only gives the clay a dark smoky color at a high temperature, but the inside glaze is dim and the ware if it does not crack has a strong tendency to do so. On the contrary, a good clear heat is obtained by using the least quantity of fuel and allowing the greatest amount of air to enter the kiln at the same time. Every pound of wood or coal requires more than ten pounds of air (151 cubic feet) to burn it completely. A kiln burning ten tons of coal in fifty hours, having a round chimney two feet in diameter, would require a draught through it something like 28 miles per hour. Complete combustion, however, cannot be obtained in an ordinary furnace; but it is a curious fact that the nearer we approximate to it the better the burn will be. I think this is true of all clay ware, for a few very bad kilns will nearly ruin the kiln bottom. Any amount of charcoal or coke, whether burning or deprived of air, will not injure the ware; it is the gaseous constituents of the fuel which produces the mischief.

When a shovelfull of coal is thrown on to the fire, about 30 per cent. is driven off as gas in a very short time, and the question arises how can the greatest portion of it be consumed? To some it might seem that nothing like a smothered atmosphere could be produced while plenty of cold air is allowed to enter the fire-hole above the coals. But the disengagement of gas is fitful, being greatest at the time the fresh coal is put on, and does not correspond to the uniform supply of air furnished by the draft. Three necessary conditions cannot be fulfilled: 1st, sufficient air; 2d, an intimate mixture of gas and air; 3d, a high temperature of the mixture ranging between 552° and 790°.

Flame is only burning gas, and if it comes in contact with a cold body or a cold current of air the greater portion of it is put out—a part of the flame extinguished, or in fact does not take fire at all. We cannot see this but we can see the effects of it—smoke. The unconsumed gases are carried up by the draught into the midst of the ware where a high temperature prevails. Here, then, is the "dead heat" or smothered atmosphere. The gas can be more completely burned, and a lively clear heat obtained as follows: Keep the grates covered; in firing, push the coals back, and put the fresh charge at the extreme front end of the grates—don't throw it back under any circumstances; don't stir the fire; shut off the draught of cold air above the fire with tight doors until the fire-holes become full up to the arch over the grates—in front only—after which the doors may be left open.

Now, instead of the fresh coal being surrounded on all sides with fire a portion of it is heated on one side only, consequently the gas will be driven off more slowly and uniformly: it is intimately mixed with a greater proportion of air and passes on through a bed of red-hot coals.

Now, considering the immense volume of air required for complete combustion it is evident that the damper must be raised gradually to the highest notch. The heat will be more uniform from top to bottom if no cold air can enter anywhere below. A very intense clear heat will be produced, considerable saving of fuel, and the ware will be burnt to a uniform light color with a brilliant slip glaze. With wood, make very small fires nearest the door.

C. T. SAXE.

Lyons, N. Y.

Among the Brickmakers.

Editor Clay-Worker:

Among the many strange things in the brickmaking business its that the Western man goes East and the Eastern man goes West for new discoveries and improved methods. So I have just been West to learn something about brickmaking.

I first stopped at Galesburg, Ill. Galesburg is becoming renouned as a paving brick center. I found there a very fine clay, as good as I have ever seen for paving brick. They have two large yards, being run to their full capacity, and are not keeping up with their orders. The Galesburg brick are being shipped a long distance—to Burlington, Ia., Quincy, Ills., Atchison, Kas., and many other places. I must say that these bricks are not as smooth as I would like to see, but it is claimed that that is no detriment to paving brick. They are using the Acme machine, manufactured at Bucyrus, Ohio, and the Penfield, made at Willoughby, Ohio. Both yards are using the Eudaly down-draft kilns. The Galesburg clay is very difficult to handle, being what is known as blue shale. This clay is almost always found over the coal measures in the West, and so far nothing has been found equal to the dry-pan to reduce it fine enough to make a good brick. The clay shrinks considerably in burning.

I next stopped at Burlington, Iowa, and I must say that here I was disappointed. Burlington has not a single first-class brickyard. I learned while there that a new company—the Burlington Brick Co.—is putting up a large plant. They had just arranged to put in the Eudaly kilns, but had not settled the machine question. They have a similar clay to that at Galesburg, and will use the dry pan for crushing. There is a large contract for street-paving to be let at Burlington soon. They put in several million last season, and now think that brick well-burned have no equal for paving purposes. If I am ever fortunate enough to visit Burlington again, I expect to find a large plant turning out a superior quality of paving and press brick.

At Des Moines, Iowa, I found a large sewer pipe factory turning out paving brick. While the brick were good I must say that I was not pleased with their methods. The plant was made for sewer pipe—not for paving brick, hence their difficulty. If their plant was properly arranged they could, in my opinion, turn out brick much cheaper if not better.

Aside from this plant I found nothing in the way of paving brick. At the Des Moines Brick Company's works (Norman Haskins, President, and J. H. Carruthers, Manager) I found the Andrus Dry-Press Brick Machine turning out splendid brick, but their burning was bad. They have a fine clay and will in time make a fine brick. I was informed while in Des Moines that two new companies had been organized to make paving brick: The Merril Brick Company, and the Northwestern Brick Company. The former have already burned enough bricks in the common scoved kiln to build a down-draft kiln. The latter company (Mr. E. D. Smith, Manager) will soon put up a large plant after the most improved plans. The clay here is splendid.

I went to Omaha, Nebraska. Here I saw many fine buildings and streets that I almost lost sight of the brick business. However, I found here a great many good yards, making brick by the ordinary methods, such as are in use throughout the country. In Omaha you will find almost all kinds of machines. I found one continuous kiln but it was not running, for which I was sorry. At the Stuart yards I found a dry-press machine making good brick, Mickel & Riley were using the Chief, the Omaha Terra Cotta Co. the Eureka and Penfield, the Nebraska Tile and Pottery Co. were using the Andrus dry-press and the Eudaly down-draft kiln. I here saw a very fine kiln of dry-press brick equal to anything I have seen. They were also building the second Eudaly kiln of a large size.

New Livicy was turning out fine common building brick, hand-made and burned in the Wingard Kiln.

At South Omaha I found the Eureka dry-press, and the foundations for several Eudaly kilns. This company (the Acme Press Brick Co.) has a very fine clay, and will, I am quite certain, make a superior face brick, and will no doubt find a good market for them.

I would like to say something about Omaha as a city, but time and space forbids, suffice it to say that we Eastern people have no conception of the magnificence of Omaha and surrounding country.

My tour of inspection does not end here, but, Mr. Editor, I presume your space is limited, so if you wish I will tell you more of my ramblings in the future.

A STUDENT.

The Cause of Shaky Brick.

Editor Clay Worker:

I have just finished reading the article headed "Shaky Brick," in the December issue of the Clay-Worker, and I think I can answer the question contained therein by giving "A Subscriber" our experience with shaky brick.

In the first place he says he has two feet of black soil on top of six feet of clay, and I presume he uses that with his clay, as he did not state clearly whether he did or did not. If black soil in his case means the same thing as black soil or "Kaley," that is found on top of our clay in Philadelphia, he need go no further for an explanation of his shaky brick, but may commence immediately to dump it to one side as useless, and as the cause of all the trouble. In every case that I know of where this kaley (as it is termed here) has been used with the clay, the brick have turned out shaky, and had a very dirty, streaked appearance in the piles. By this I mean a dirty whitish streak and heads of the brick similar to that observed on the face of some buildings that have been standing for some time. With us it is very important that we get the clay banks clear of all the black soil, and whether it is two inches or two feet it has to come off.

But, granting that this black soil that "A Subscriber" has on his bank is a kind of clay and a fit material for making brick, and that I am wrong in calling it Kaley, then he must look for some other cause for his trouble, and I think he may find it in his four feet of what he terms whitish clay. I know of six banks in our own immediate vicinity that contained more or less of this whitish clay, but none so deep as four feet, and every one of the brickmakers that used it had the same trouble with shaky or brittle brick, as we call them, that "A Subscriber" has. I have noticed the brick after being burned to be apparently strong, but, on striking them together, they would break into two or three pieces, and where the break occurred a smooth glassy surface presented itself, entirely different from the rough irregular edge of a break on a strong brick. This is more noticeable in the brick immediately above the arch on the top hangers, the skintle in the arches, and in fact any place close to the fire where the bricks are crossed and have any considerable weight upon them.

This whitish clay with us, when dry, is brittle and crushes into dust very easily, and has a sandy, gritty feeling when rubbed between the fingers. When wetted it has the appearance of strong bluish clay, yet the grit of the glass and sand can easily be felt through it. My advice to "A Subscriber" is to make a few bricks from the black soil entirely, and a few from the whitish clay, burn them close to the fire, and I think he will have no difficulty in determining which of the two causes him all his trouble.

F. B. McA.

Philadelphia, Pa.

Cost of Burning Brick.

Editor Clay Worker:

I am one of those unhappy mortals whom you designate as "poor unfortunates, stay-at-homes," etc. I could not get to the convention owing to circumstances over which I had no control, so I had to content myself with reading the very full and interesting report of the proceedings in the Clay-Worker. In looking over the discussion on continuous kilns which followed the paper of Mr. Hoffman on that subject, it occurred to me that brickmakers, who are not acquainted although desirous of becoming so, with the cost and working of this kiln, might form a very erroneous impression from the arguments used, and if you will kindly allow me the space, I will try to put the matter a little more clearly, and give these gentlemen what they want, i.e., more figures and less talk.

First I want to point out how useless it is for a man to tell another, who is burning brick perhaps 500 miles away, that his cost for burning is so many cents per 1000. This does not convey the slightest idea at all, as the circumstances vary so much in different localities. If he would say that he uses so many pounds of coal per 1000 at so much per ton then others can compare notes with him, and if he will add the length of time, including water-smoking, to burn the kiln, what proportion of hard brick, salmon and bats, it will be better still.

In comparing the cost of burning in a continuous kiln it is particularly necessary to look at all the points, or else by taking high prices in one place and low ones in another you may make the open kiln come out the best. For instance, a continuous kiln will burn brick, on an average, for a quarter the amount of money that the open kiln will, allowing the same clay, same make of brick and same locality. Now, suppose a man in, say, Ohio is using open kilns, and he gets his lump coal for $1.00 per ton, and he uses, say, one-half ton per 1000. This brings his bill for fuel to 50 cents per 1000. Another man in, say, Massachusetts is using a continuons kiln. He would have to pay at least $5.00 per ton for lump coal there, or $4.00 per ton for coal dust. The long haul makes coal dear there, and of course the freight on the dust is the same as on the lump. If he used one-fourth ton of dust (and he would not use more) his burning would cost $1.00 per 1000. According to these figures the continuous kiln is costing more than the open one, but to make a fair comparison let the latter be placed beside the former in Massachusetts. The open kiln would then require one-half ton at $5.00 per ton, which would be $2.50 per 1000 as compared with $1.00 per 1000 in the continuous kiln. Or, bring the latter to Ohio; wherever lump coal can be bought for $1.00 per ton they are glad to get rid of coal dust; any way it could be bought for 30 cents per ton, and at the rate of one-fourth ton per 1000, the cost in the continuous kiln would be 7½ cents as compared with 50 cents in the open kiln as above.

Again, to compare the two kilns in a yard with which I am acquainted in Kansas, making dry-press brick: The average cost for labor in burning an open kiln is about 45 cents per 1000, which allows one burner and two helpers by day and same at night for 12 arches. Wood is $3.00 per cord and lump coal $3.50 per ton. Two cords of wood per arch of 20,000 brick are used for water-smoking, and one-half ton of coal for burning. This gives: For labor 45 cents, wood 30 cents, coal $1.75; total $2.50 for 1000 for labor and fuel in burning. A continuous kiln on the same yard holds 300,000 brick, and is burnt round in 15 days costing one man at night and one in daytime for labor and three car loads of coal dust—that is 60 tons at $2.25 per ton, which gives for labor, two men at $2 00 for 15 days, $60 00; for coal, 60 tons dust at $2.25, $135.00; total, $195.00 for 300,000 brick, or 65 cents per 1000 for fuel and labor, as compared with $2.50 in the former case.

A good deal has been said about loading bricks from these kilns. Bricks are either sent away by railroad or wagon. If the former, they have to be wheeled away by barrows into the car in most cases, and it costs no more to wheel them from a continuous kiln than an open one; and if the latter, then the doorways in the continuous kiln can be built large enough for the wagons to be backed into the chambers and the loading then will cost no more in one kiln than another.

R. R. GRAY.

A Pilgrim's Views and Observations.

Editor Clay-Worker:

I have completed my tour of almost eight months amongst the mighty men of bricks and machinery, and feel but one disappointment with the result, and that was my inability to attend the convention held at Memphis.

I have performed a pilgrimage, as it were, in search of the shrines, whereat could be found, good locations, and clay, fire brick, progressive men, new and improved machinery of all kinds for brick and tile, especially new machinery for moulding brick by the dry or semi-dry process, to investigate kilns, particularly the new down-draft claimants for public favor, to study the petroleum fuel and gas fuel problem, to investigate fire-proofing by the *porous* terra cotta lumber process, to form acquaintance in the business amongst its best men, and by observation, to profit by other people's experience.

My journey has been to me a gratifying success, and I have not only obtained the knowledge sought, but I have also been treated with kindness and courtesy wherever I visited although it was quite evident that I carried a large sized augur with me to "bore" for "pay dirt," and *how* each individual or firm converted it into good brick.

CHICAGO.

Here, I found a fruitful field for investigation for here was to be found not only good brick from this vicinity but from all quarters of this country.

The Hydraulic Pressed Brick Co., of St. Louis, seems to have a mighty grip on public favor and their choicest productions are found on every hand, in the grandest of buildings, and their trade growing.

Toledo, Milwaukee, Tiffin, Zanesville, Philadelphia, Baltimore and other cities send here their best wares and yet with great home talent to supply the demand, "free trade" in brick piles up large fortunes for individuals and companies.

The Anderson Co. and the Tiffany Press Brick Co. show in extensive lines and varied shapes, very fine productions, the former a *new* pinkish gray brick set in novel and beautiful designs for six stories, above a ground story of massive Egyptian style in a harmonizing tint of stone.

Oh, yes! I found progress in men and methods there, and a great striving for new and better productions.

Petroleum fuel seems to be, for old-fashioned and *up-draft* kilns, a success. Certainly it is so in the handling of it by Purington, Kimbell Co. Mr. D. V. Purington afforded me every facility at his yards to note all the technical details of its application and operation at a kiln of 840,000 brick. There were twenty-four openings each side, and the forty-eight fire-ways were as completely under instant specific control, as if there was but one opening. Mr. Purington's experience in burning 30,000,000 brick, proves it to be a gratifying success as to cost, care and trouble, and makes it almost the ideal fuel. The company use the "Rhoads" Burner.

One of the wonders of Chicago, in fact of the United States, is the fire-proofing of the auditorium building by the Illinois Terra Cotta Lumber Co. With this porous material they have lined and partitioned the inside, laid the floors and ceilings, covered every pillar, girder, and brace, round, square, or any other shape, and thus have made iron at last fire-proof with clay. Their works adjoin the city at Kensington, on Lake Calumet, from which they excavate their clay, which is ground up with coarse sawdust in proper quantities until plastic, and then it is molded into "lumber" by two Penfield and two Clark machines. Mr. A. W. Beidler, Superintendent, and Mr. C. H. Bebb, Constructing Engineer, gave me every facility to study their processes and the application of the material, which is looming up as one of vast interest to brickmakers all over the country.

For ventilation and dryness it is to-day the best of all earth materials for inside walls and partitions.

The Pullman Brick Co. are using petroleum fuel for their mud and plastic made brick with much success.

As in other places, I found some individuals working some wonderful methods of making and burning wonderful brick, but in *profound secrecy*, so secret in fact, that I could not find even a building made from them on which to ravish my longing eyes, but they generally had "the only" presses, "the only" kilns, and "the only" oil burner, but yet none of their bricks drop off of fourteen story buildings on to the doubters.

Chisholm, Boyd & White, of that city, had just completed a new "dry press," that a careful inspection of convinces me, will be a strong candidate for public favor. It is the "New Boyd." Of very compact, sightly, and powerful construction, with a medium speed and novel application of pressure, yet with three molds it gives a good day's output.

At Chenoa, Castle & Pike appeared to have a good down-draft round kiln for coal and wood (and needing little of either to burn it) that for pipe and tile, works just right. Specimen bricks burned in their "New Discovery" Kiln, were very fine for hardness and color. They use the New Departure Pipe and Tile Press, of the Anderson Foundry and Machine Co., with great success.

At Anderson, Ind., I found the Anderson Foundry & Machine Co. doing a fine business with their twin pets, the Chief Brick Machine and the New Departure Tile and Pipe Press. The Chief I found at work in the yard of Jones & Clemens, near town, and when it comes to a mud or semi-stiff clay machine here is the very "chief." It is built all of iron and steel, harmonious in adjustment and movement, easy and simple to handle, turns out good, well-tempered brick, and a large day's work. Their New Departure Pipe and Tile Press I found at work at Summitville, at the factory of Mr. S. C. Cowgill, who declared it to be the only one out of fourteen (I think 14 was the number) he had used, that he had found to be perfect. This gentleman's word is considered law amongst those who know him, and my close examination of the press, and its work, convinced me he was just right. It is a vertical operating machine, but has a horizontal pug mill chamber, and with both vertical and horizontal screws has a very powerful compound action. It is built of iron and steel, and gives a large output of very fine material, also it delivers vertically or horizontally.

At Anderson as well as other places I found brick burning done most beautifully with natural gas.

I stopped over at Columbus to visit the Fish Co., and found them running Whittaker Presses and a 14 chamber Radford Kiln.

My secret declaration that almost any kind of *true clay* can be molded into good brick if *understandingly* handled, is made good in a great measure by the Fish Co., as they are working against a bank vertically composed of eight to ten different colors and kinds of clay, with about 18 inches of semi-stone shale at the bottom, all of which when ground up into a clay hash comes out a good hard red brick selah! However, Fish has good, tenacious hard sense, a good kiln, and a *fine burner*.

At Zanesville I centered all my interest on the Eudaly Down Draft Kiln, one being in the "burn," and two in course of construction, one of which was nearly finished, and the other in that naked skeleton state, in which all its ribs, joints, "inwards," and backbone was delightfully visible, so that the working parts, and the scientific principles underlying it's operation were patent to any person of ordinary intelligence.

This was at the yards of T. B. Townsend & Co., and I was placed under many obligations by Mr. Burton, of the company, for not only giving me every facility to study the kiln, but also for valuable information as to costs in detail and for points of interest connected with it, and for a thorough showing up of their plant and processes. Any one wishing to investigate the Eudaly Kiln at their yards will be welcomed.

Their bricks are hand-moulded, also made on a Martin mud machine, and then duly repressed into most beautiful red bricks of plain and fancy shapes.

The company owns and occupies a very unique and handsome building for a town office, and inside it is lined with their own enameled brick, in various colors. The most striking feature in their office is the beautiful hearth and fire place made from black enameled brick. The inside of the office and building is well worthy of illustration in the Clay-Worker.

At Zanesville I found the Zanesville & Oakland Press Brick Co. making the brick "par excellence" of all I have yet seen. They are the crowning glory in red, the ideal in angularity, fine edges and smooth finish, and perfection in grain. The company uses Whittaker Semi-Dry Presses.

In conclusion let me add that all my visits show to me, that the spirit of progress is working in the "craft," the "theorists" have at last got in their "fine work" even among the "doubting Thomases," who find their neighbors passing them by, and who seem to get their discoveries out of the journals and books and things, which is contrary to old fogy ideas and "experience, sir." They at last wake up, and find progress is springing from ideas generously sent broadcast by the men who burn the midnight oil, and write, and "speechify," and rush into conventions, and *exchange ideas*, yea they rush even into printer's ink generally and help, to spread light on a noble art, and better still in this new era, there is not only honor, but there is also "money in it." DANIEL EDWARD RYAN.

In Favor of the Continuous Gas Kiln.

Editor Clay-Worker:

Kindly allow me space to correct an error in the remarks of Mr. Batley at the convention and reported in the Clay Worker. I see in the course of his remarks that he was once an Englishman; so was I, and I think it is characteristic in Englishmen, as well as other nationalities, to love fair play. Now, I don't call it fair play to injure another fellow laborer by talking about him in his absence, and saying what is not true at that. It shows to my mind either a spirit of carelessness in regard to facts or a lack of good taste.

The error complained of is contained in the remarks of Mr. Batley on continuous kilns. He said of the Guthrie Continuous Kiln, in use by the Columbus (O.) Brick & Terra Cotta Company, that "it was built by an Englishman named Bennett, a man who wasn't altogether square; who represented to that company that he knew how to build the kiln; that he did build it, but couldn't work it, but it was fixed and is now working all right."

Now I happen to be personally acquainted with the builder of that kiln, by name Henry Hibbert, and happen to know the difficulties he had to encounter in the building of it caused by poor material and other sources, and I know that he worked the kiln very successfully against a stiff opposition, and that through internal dissension a professional brick works expert was engaged to satisfy the shareholders on some point, and I also know that he failed to accomplish as much as Hibbins had accomplished.

The fault all through this matter lay in bogus representation of the clay. The Guthrie kiln was erected to burn fine red brick and terra cotta, when in fact there was no material for the work on the company's property. The name of the company combined with the fact that they are now making fire brick exclusively proves this point.

Time came, when through this internal dissension before mentioned, the company decided on a re-organization. About this time, Mr. Hibbert had an offer of another situation, which he accepted, although against the wish of the Columbns Company. After the re-organizaiion—now, here's where Mr. Batley might have been right if he had only taken the trouble to be correct—a man, whose name I need not mention except that it was not Bennett either, came along and represented to the company that he knew all about the Guthrie kiln. He was engaged at a very small salary, low enough to prove that he knew nothing at all about it. Of course, as is usual with such men, "This was not right," "That would have to be altered," and so on, until he got the kiln thoroughly "muddled;" then, after acting "not altogether square," he skipped. But it was fixed, and is now working all right."

That is not much to say, but it took a lot of getting back to where it is to-day, with the few trifling exceptions consequent to a change of material. This same Mr. Hibbert, last year built a Guthrie kiln for a very extensive firm of press brick manufacturers in Illinois, by which firm I have the honor to be employed. It was this kiln that our friend Mr. Blair described as working successfully, which statement I can endorse. I have in mind a Guthrie kiln erected and worked very successfully by Mr. Hibbert in the north of Ireland.

I have had business relation with Mr. Hibbert for a number of years and know just what I am talking about. Like Mr. Batley I have no axe to grind, but I could not allow so misleading and unfair a statement to pass uncorrected. As for the Guthrie kiln, I believe it to be the kiln par-excellence. It will burn bricks, common and face, tiles and terra cotta, and is one of the most, if not the most, economical kilns in use. As Mr. Blair said: "The fuel does not mix with the brick at all, but is burned in a gas-generating producer, the heated gas that passes through the ware, penetrating to every part alike. I have not room in this, already too long, article, to say more on this (kiln) subject, but will be glad to answer any enquiry from your numerous readers. J. W. CARSON.

Cahoun Co., Ills.

Strength of Brick Work.

Editor Clay-Worker:

In the report of the late convention of the National Brickmakers Convention I noticed [p. 31 of January Clay-Worker] that one of the members was "wonderfully provoked" at the absurd ideas of brick users concerning the crushing strength of brick masonry. Allow me to remark that I am surprised that the "provoked" member did not make his case stronger, as the facts undoubtedly show he had a right to.

In the discussion above referred to one member said that "a wall two feet thick laid in excellent mortar and ordinary brick, will stand its weight 200 feet high." A second member cited a brick chimney 200 feet high, and a third referred to one 300 feet high. In Glasgow, Scotland, there is a brick chimney 436½ feet high, and another 454 feet high.

I have recently sent to the printer the manuscript for a book—"Treatise on Masonry Construction," to be published soon by John Wiley & Sons, New York City, which contains a large amount of data on the strength of brick and brick masonry, of which I recall the following: By actual experments in a testing machine the average strength, from 15 experiments, of piers laid in ordinary brick and common lime mortar, using the same care as that with which ordinary brick masonry is built, stood a few pounds (I am writing from memory) over 1500 pounds per square inch, which is equal to 216,000 pounds per square foot, or the weight of a column of brick 2,000 feet high; with ordinary Portland cement mortar the strength was for a mean of eight experiments, 2,500 and some odd pounds per square inch, which is equal to 360,000 pounds per square foot, or the weight of a column of brick masonry 3,600 feet high. Did any one ever hear of brick masonry being crushed by any load brought upon it in an actual structure?

IRA O. BAKER,
Prof. of Civil Engineering.

University of Illinois,
Champaign, Jan. 28, 1889.

A BIG THING IN RUBBER BELTS.

We present for the benefit of our readers, an excellent illustration of two enormous vulcanized rubber belts, manufactured by the New York Belting and Packing Co., New York, for parties in West Superior, Wis. Each of these mammoth belts measure nearly half a mile in length, and weigh 11,000 pounds. Had they been made of leather, they would have required at least 500 selected hides to manufacture each one of them. The company have distinguished themselves in the manufacture of large belts. A driving belt fifty-two inches wide, eight-ply, measuring 298 feet long, and weighing 4,000 pounds, was also furnished with the belts illustrated. Recently a belt 2,700 feet long was made for the Pennsylvania Railroad Company, and is now in use in one of their grain elevators in Jersey City. It is used as a conveyor belt, transferring grain from one end of the building to the other, which is taken off by a simple form of guide arm at any portion of its length, as well as at the end, and conducted into chutes for delivery to vessels at the end of the dock. The belt runs on smaller rollers, and there is a simple form of tightener at the ends, by which it can be readily kept straight and even. In making conveyor belts of this description, the company has long held a leading place, the superiority of such belts in point of economy, as well as of efficiency, has never been equalled. It is of interest to mention that Vulcanized Rubber Belting was first introduced by the New York Belting & Packing Company, and they are now the oldest and largest manufacturers of Vulcanized Rubber Goods in the United States.

The principal factory of the company is located at Newtown, Conn., and it is the oldest one engaged in the rubber business, although they have another one at Passaic, N. J. The offices, salesroom, and warehouse, are conveniently located at 15 Park Row, New York City, where an almost endless variety of vulcanized rubber goods, including their celebrated packing, hose, mats, and matting can be seen. They also have branch offices in all the principal cities of the Union. Mr. John H. Cheever is the treasurer of the company, and will gladly forward catalogues, circulars, or any other information desired concerning their wares, upon application.

THE ILLINOIS TILE-MAKERS.

The eleventh annual convention of this Association was held at Springfield, Monday and Tuesday, January 21st and 22nd, 1889.

The attendance showed a noticeable falling off compared with former years, due, doubtless, in a large measure, to the change of date which was not known or understood by many, and in part to dull trade which seems to prevail throughout that state.

The reports of members indicate a poor business generally the past year but nearly all seemed confident that there is "a good time coming" and that the prospects are fair for a good trade this year.

The first session was devoted to informal talks on this subject.

Second Session:—Convention called to order by President Pike, at 2:30 P.M. The Secretary and Treasurer made their usual reports, the latter showing a small balance in the treasury.

Mr. Joseph Fifer, the newly elected Governor of the state was introduced to the members and spoke in an informal manner expressing an interest in the work of the convention and pledging his best efforts to advance the cause of land drainage which he regarded as among the most important and necessary means of advancing the agricultural resources of the commonwealth. The Governor by his plain, hearty manner, created a very favorable impression and at the close of his address a recess was taken to enable the members to take him by the hand, which all did heartily.

Mr. D. O. Loy then read a poem on the Benefits of Drainage which proved *the hit* of the convention. It is given in full on a preceding page.

Mr. G. C. Stoll read a paper on the "Best Methods of Making Tile," which was listened to attentively and the thanks of the Association tendered him. The paper was sharp and to the point and will be given in a future number of this journal.

A practical paper entitled, "How to Avoid Mistakes in Tile Drainage," was read by Prof. E. I. Cantine, of Bloomington, Ill., for which he was tendered a vote of thanks.

The Question Box was then given attention. The query "Which is the best machine for making paving brick," was "given up" as there was a diversity of opinion on the subject.

Mr. Eudaly said he had seen several different machines in successful operation but thought the stiff-mud machines best.

The subject of "Paving Roads and Streets with Brick" was discussed at some length, several members testifying to the durability of brick as a paving material having seen it in actual use for several years with the most satisfactory result.

Third Session:—Called to order by President Pike who introduced Mr. H. S. Barton, of Ottawa, who read a paper on "How to Increase the Demand for Tile," which was written by E. G. Osman, who was not able to attend.

Mr. Leeper explained that he was not a tile maker but a tile user. He is a large farmer and has been underdraining his land for several years and considers tile one of the best possible investments for farmers. Nothing in the way of legitimate investment pays so well he thinks.

The "Prevention of Cracking in Drying" was debated at some length. Mr. McCabe stated that he had a very peculiar clay to work and he found he could not use it without great loss after it had been frozen. Seventy-five per cent. of brick or tile made from clay that had been frozen would crack in spite of anything he could do to prevent it. His clay cracks badly anyway except when he can dry in the shade where there is no air currents, then he has no trouble.

Mr. Loy had trouble with die-made brick cracking in drying, they would check all over the sides. He now overcomes the difficulty by attaching to the die a piece of thin metal with rough or uneven edges which scratches or roughens the surface. The laminated surface he thinks is the cause of his trouble and the roughing of the outer surface overcomes that and enables the brick to dry faster.

Mr. Dawson said he mixed ashes and cinders with his clay which prevented cracking.

Mr. McLean claimed this use of cinders weakened the brick. He makes an excellent paving brick by mixing one-third potters' clay with the common.

Fourth Session:—Convention called to order by President Pike at 2:30 P. M.

The subject of "Road Drainage" was discussed at some length.

The Election of Officers resulted as follows: President, E. M. Pike, Chenoa, Ill.; Vice-President, Alex. McLean, Macomb; Secretary, G. C. Stoll, Lexington; Treasurer, Jno. McCabe, Rushville.

On motion the officers of the Association were constituted a programme committee and the convention then adjourned to meet the third Tuesday in January, 1890.

NEW INVENTIONS.

List of U. S. Patents issued since our last number appertaining to brick, tile, terra cotta, sewer pipe, pottery, etc., and the machinery used in their manufacture, compiled by Joseph A. Minturn, Engraver and Solicitor of American and Foreign Patents, Rooms 29 to 33, Old Sentinel Building, Indianapolis, Ind.: (Copies of any U. S. Patent furnished for 25 cents, postage prepaid.)

393,840. Culvert or Drain Tile—C. F. Mabis, Adair Co., near Green Top, Mo.
394,510. Brick Machine—R. N. Ross and H. H. Kellar, St. Louis, Mo.
394,528. Hydraulic Brick Machine—H. Von Metzlaff, Potsdam, Prussia, Germany.
394,842. Machine for Elevating and Delivering Bricks—C. H. Eichler, Dresden, Germany.
10,976. (Re-issue). Brick Mold Sander—A. Naylor, assignor to A. H. Newton, Cohoes, N. Y.
394,979. Brick Machine — G. Haut, Perham, Minn.
395,128. China Kiln—N. M. Fitch, Springfield, O.
395,212. Brick Machine—G. Campbell, Milwaukee, Wis.
395,590. Making Brick—G. Sattler, Sr., and C. Nagel, St. Louis, Mo., assignors of one-half to G. Sattler, Jr., East St. Louis, Ill.
395.689. Combined Brick Dryer and Kiln— M. A. T. Boehncke, assignor to Continuous Kiln Co., Omaha, Neb.
395,765. Brick Machine—W. Weeber, Philadelphia, Penn.
395,871. Brick Machine—J. J. Brewis, Chicago, Ill.
396,466. Tile Machine—C. Carr, Boston, Mass.
396,589. Making Rolls for Embossing Plastic Material—H. McHugh, New Bedford, Mass.
396,733. Brick Kiln—F. W. Dennis, Beatrice, Neb.
396,966. Brick Kilns—J. Taber, Wolfborough, Mass., assignor to himself and W. Emery, Alfred, Me., and G. M. Stearns, Boston, Mass.

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T. A. RANDALL & CO.,
25 Thorpe Block, Indianapolis.

COMING CONVENTIONS.

The Ohio Brick, Tile and Drainage Association will hold its next annual meeting at Columbus, O., Tuesday and Wednesday, February 12th and 13th.

The Michigan Brick, Tile and Drainage Association will meet in convention Tuesday and Wednesday, March 12th and 13th, at Adrian, Mich.

SKILLED LABOR.

The introduction of machinery has so deranged mechanical labor in nearly all its departments as to seriously endanger a supply of skilled workmen for the future. The apprentice of today who learns the trade of a carpenter and joiner, acquires only the art of putting up work already prepared to his hand at the planing mill or sash factory. Bricklaying and plastering are exceptions to this general rule. The march of innovation has scarcely touched these two handicrafts, and yet the number of apprentices to these arts is by no means keeping pace with the demand for skilled workmen. If it were not for the foreign supply the deficiency would, even now, be seriously felt.

The labor organizations have been charged with producing this deficiency by limiting the number of apprentices which a master workman may have at any time, and thus maintaining prices by keeping the supply of skilled labor below the demand. Whether the motive here assigned be the cause or not, the limitation complained of certainly has the effect to reduce the number of well-trained workmen in these departments. The greater danger is that this deficiency will be supplied by self-constituted bricklayers and plasterers, who have imperceptibly passed from the hod to the trowel. These may ultimately make good workmen, but the public must suffer from many an imperfect job while this skill is being acquired.

But aside from this restriction of the master workman, it cannot be denied that there is an aversion in the average American youth to getting down to manual labor, and especially in the dependent attitude of an apprentice. This is an outgrowth of the commercialism which has permeated society everywhere. It is an insane desire to accumulate wealth suddenly by the exchange of commodities which the labor of others has created. This is especially unfortunate at the present crisis. The boy who to-day looks out on the world with an inquiring eye, which seems to say: what shall I do? sees a vast continent lately reclaimed from the forest and prairie, dotted all over with cities, villages and farm houses, built, in general, of frail and perishable material which in the near future must give place to permanent structures, built of imperishable materials. Brick must take the place of wood in all architecture whether humble or high, so far as walls are concerned. Forty years hence, the great demand of city, town and country, all over this land, will be builders and building material; and that means brick, bricklayers and plasterers. The youth who looks forward to the time when our temporary buildings must be replaced by permanent structures, and qualifies himself to be an actor in that crisis, will reap a rich harvest, and be amply rewarded for the time and labor given to this preparation.

STRENGTH OF BUILDING MATERIAL.

At a recent meeting of the Engineers Club of Philadelphia, an interesting report was made of a practical test of the strength of building material. The test related to the pressure per square inch required to crush the material. Massachusetts marble heads the list, sustaining a pressure of 20,500 pounds per square inch. Indiana limestone (Oolitic, we suppose) crushed under 7,190 pounds, and Philadelphia pressed brick yielded to a force of 7,210 pounds. Common hard brick, laid in Portland cement, sustained a pressure of 1,600 pounds, but if laid in common lime mortar it yielded to a pressure of 800 pounds per inch. But no ordinary building will give 500 pounds pressure to the square inch. Under common circumstances, the durability of a material is more important than its strength. There, hard-burned brick stands at the head.

THE STRENGTH OF BRICK WORK.

Our readers will find on page 98 of this issue an interesting communication from Prof. I. O. Baker under the above caption. We have recently received the proceedings of the annual convention of the American Society of Civil Engineers, held at Milwaukee last June, when a number of papers on the manufacture and use of brick were read and discussed by the members. We make the following extract from Prof. Baker's remarks bearing on this same subject:

"The general opinion is that brickwork is in every way inferior to stone masonry. This belief may have been well founded when brick was made wholly by hand by inexpert operatives, and imperfectly burned in the old-time kilns, the product being then generally poor; but things have changed, and since the manufacture of brick has become a business, conducted on a large scale by enterprising men, with the aid of a variety of machines and improved kilns, the product is more regular in size and quality, and in every way better than formerly. I believe that there are many engineering structures in which brick could be profitably employed instead of stone; as, for example, the walls of box-culverts, cattle-guards, etc., and the less important bridge piers and abutments, particularly of highway bridges. The correct rule for such structures is to construct them of as large stones as possible; but if they are built of good brick, laid in strong cement mortar, they will be more nearly monolithic and better than they generally are.

"Brick-work is preferable to stone masonry in several respects, as follows: 1. In many localities brick is cheaper than stone, since the former can be made near by, while the latter must be shipped. 2. As brick can be laid by less skillful masons than stone, it costs less to lay it. 3. Brick is more easily handled than stone, and can be laid without any hoisting apparatus. 4. Brick requires less fitting at corners and openings. 5. Brick masonry is less liable to great weakness through inaccurate dressing or bedding. 6. Brick-work resists fire better than limestone, granite or marble; sandstone is the only variety of stone that can compare with brick in power to resist fire. 7. Good brick stands the effect of weathering and of the acids in the atmosphere better than sandstones, and in durability even approaches some of the harder stones. 8. All masonry fails when the mortar in its joints disintegrates or becomes dislodged; therefore, brick masonry will endure the vicissitudes of the weather as well as stone masonry, or even better, since the former usually has thinner joints.

"The heaviest pressure borne by any masonry structure—the towers of the Brooklyn Bridge—is a little less than 400 pounds per square inch (28 tons per square foot); while experiments made at Watertown showed the average strength of brick piers laid with mortar composed of one part Rosendale cement and two parts sand was 1,972 pounds per square inch (140 tons per square foot), and with a mortar composed of one part Portland cement and two parts of sand was 2,544 pounds per square inch (180 tons per square foot). The piers were built by a common mason with the same care as that usually given to ordinary masonry. If brick masonry of the quality of last-mentioned piers were substituted for the granite masonry of the towers of the Brooklyn Bridge the factor of safety would still be about 6¼; and if substituted for the limestone masonry, the factor would be 20.

"In conclusion, it may be well to state that I have no financial interest—even the most remote—in the brick industry.

THE CHICAGO BUILDERS' AND TRADERS' EXCHANGE.

The above named organization held its fifth annual meeting Monday, Jan. 21st. The reports of officers showed a satisfactory condition of affairs. During the past year the membership has increased from 509 to 574. Secretary John reported the available assets of the Exchange to amount to over $17,000. The following officers were elected for the ensuing year: President, D. V. Purington; First Vice President, H. J. Milligan; Treasurer, Emanuel Earnshaw; Secretary, James John. Directors: Robert Vierling, C. B. Kimball, E. V. Johnson, Adam J. Weckler and M. B. Madden. Inspectors of Election for 1890: Fred G. Cobb, M. W. Powell and A. W. Murray.

This organization though in its infancy has already done a great work in uniting and harmonizing the different trade unions connected with building interests of Chicago, all of which are identified with it. Its material prosperity is therefore a source of much gratification.

BRICK, AN ARTICLE OF COMMERCE.

In the year 1888 the Hydraulic Press Brick Co. (St. Louis), put on the market seventy-three millions of brick. Besides the home consumption, the company shipped fifteen hundred carloads to points in Illinois and elsewhere. We observe that a branch factory at Findley, Ohio, turned out twelve millions of this amount. Of course we suppose that this Findley lot were made by steam generated by natural gas and burned by the same fuel. This is an immense saving, amounting to about one-half the expense of manufacturing by any other fuel, except it may be crude petroleum. The time is near when the Indiana gas field will furnish brick to the great prairie region west of us, at a cheaper rate, and of a better quality than they can possibly be made at home.

THE GREAT IRON TOWER OF PARIS.

Since the ambitious workmen of Shinar failed in their project of a tower of brick, "whose top should reach the heavens," men have been more humble in their aspirations. The highest of the Pyramids of Egypt reached but little more than 400 feet in height, and our Washington Monument was content to stop at 550 feet; but now the French are determined to outdo the folly of Babel. The Eiffel Tower in Paris is already more than 700 feet high and bids fair to reach its completion at 1,000 feet in March next. It is built exclusively of iron and steel, and rests on a massive stone foundation. It is designed for no use, only to look at, or rather, to look from.

Architect Osterling, of Minneapolis, has projected an American folly almost equal to that of Paris. It is a house to be built of iron, 28 stories high! What about the blizzards of that climate?

PETROLEUM.

It is scarcely forty years since mineral oil came into general use for lighting purposes. At that time a corner of Northwestern Pennsylvania was supposed to be the only spot on the globe that promised a practical supply of petroleum. Subsequent researches, however, reveal the fact that scarcely a portion of the earth, of any considerable extent, is destitute of a supply of oil. While these discoveries are being made, the use of petroleum for fuel purposes has been introduced, and bids fair to be a successful rival of coal. Indeed, for convenience of use and intensity of heat it stands second only to natural gas. The great Russian oil field on the Caspian Sea is largely supplying the European demand, and late intelligence from India informs us that an extensive oil field has been discovered in the Assam Valley, which will supply light and fuel for India. Such is progress in the nineteenth century.

A SUGGESTION.

It is claimed by some that no letter written by a true representative of the fair sex (an "effeminate woman") is complete without a postscript. Now, however this may be, we know that many times a brief postscript is the most interesting and pleasing feature of a good letter. We also know that men might profit in many things by following examples set by "their sisters and their cousins and their aunts."

We are led to these reflections by the knowledge that there is a short postscript that many of our readers could add to their business letters and by so doing afford much real satisfaction to their correspondents and also benefit us. It is short—only three words—and may be written thus:

P. S. The Clay-Worker.

NATIONAL ASSOCIATION NOTES.

There will be a meeting of the Executive Committee of the N. B. M. A. at Philadelphia, Pa., Feb. 13th, when the place and date of the next annual meeting will doubtless be determined.

One of the "poor unfortunates" who didn't get there writes under date of February 6th: "I have been very much interested in your report of the annual meeting of the Brickmakers and can readily understand that the promoters and members thereof have gained much more knowledge than it is possible to abstract and publish." Moral: Don't miss the next meeting.

The Corresponding Secretary of the National Brick Manufacturers' Association recently received from Vice President John McCain of Denver, Col., a remittance of thirty-four dollars, membership fees of all the brickmakers of Denver, who, be it said to their honor, join the National organization in a body. The Denver brethren have one of the best local associations in America and thus know and appreciate the benefits of thorough organization and affiliation. "What's the matter with McCain?" "He's all right."

Read the "For Sale, Wanted, Etc.," columns for bargains.

EDITORIAL NOTES and CLIPPINGS.

San Diego, Cal., is to have a pottery.

N. P. Foard will start a brick yard at Martinsville, Va.

McNeil & Belvine will run a brick yard at Rusk, Tex.

W. T. H. Lee contemplates building a brick yard at Easton, Md.

The East Palestine (Ohio) Pottery Co. has been incorporated.

The Bessemer (Ala.) Fire Brick Co. will build another dry house.

Lynchburg, Va., is probably to have a brick yard.

Nick Cruger, of Albany, Ga., is building a flue dryer and Morrison's Kilns.

The Roanoke (Va.) Brick Mfg. & Construction Co. will start a brickyard.

C. G. Nickel, a well-known brick manufacturer of Baltimore, Md., died recently.

The Rochester Pottery Co., of Beaver Falls, Pa., has been chartered; capital $30,000.

The Canton & Malverne Fire Brick Co., of Canton, O., have incorporated; capital $30,000.

The Illinois Pipe & Tile Co., at Sterling, Ill., has been incorporated. Capital $30,000.

Chauncy Hyde, a veteran brickmaker of Chicopee, Mass., died January 19th, aged 76 years.

Jno. C. Hodges, of Golden, Col., has put in an Andrus Dry Press Brick Machine.

The Seattle (W. T.) Brick & Tile Co. has been organized with capital stock of $50.000.

Paul Wooten's brick yard at Egg Harbor, N. J., was partly burned Jan. 22d. Loss, $2,500.

P. B. Sager & Co., of Bay City, Mich., will increase their capacity by the addition of another machine.

An extensive bed of very pure kaolin is said to have been discovered at Golden, near Denver, Col.

B. S. Elmer, of Springfield, Mass., and C. B. Doody, of Hartford, Conn., will go into the Terra Cotta business.

Mess. Chisholm, Boyd & White, of Chicago, are having a very satisfactory trade in Dry Press Brick Machinery.

The Grape Creek (Ill.) Clay Works will make brick by the dry press process having put in an Andrus Machine.

The Bessemer (Ala.) Fire Brick Co., contemplate enlarging their works to double their present capacity—20,000 a day.

Gladding, McBean & Co., well known Sewer Pipe Mfrs. of San Francisco, Cal., will manufacture Terra Cotta Lumber also.

H. W. Bricknam, Columbia Falls, Me., is making preparations to start a brick yard. He has a large bed of excellent clay.

Mitchell, Renz & Co., will start a brick yard at Bridgeport, Fla., and want a brick machine. They have a boiler and engine already.

Glen Ullion, Morton Co., Dak., is thought to be a desirable point for the establishment of a brick yard. Mathias Zinsmayer can give full particulars.

Jos. B. Oberly, of Perkasil, Pa., has bought T. W. Darby's brick yard at Wilmington, Del., and will put in another machine and additional racks and pallets.

Experienced burners and foremen desiring situations should scan the "Wanted" columns, or, better still, let their wants be known by proper announcement in that department.

The Brew Pottery Co., of Trenton, N. J., will remove their factory to Tiffin, Ohio. They employ 700 hands and have a capital stock of $250,000. We presume they are after natural gas.

Persons having the circular of the well-known house of C. W. Raymond & Co., of Dayton, O., are requested to send for their 1889 supplement containing recent inventions and valuable improvements of interest to brickmakers.

A brick yard is wanted at Williamsburg, Franklin Co., Kan., which is thought to be an excellent location for a small yard. They have an abundance of good clay and good railroad facilities. For full particulars address G. F. Appleton, at that place.

F. W. Krause, of 107 South Leavitt St., Chicago, writes that he is preparing to start a brick yard near that city. He is favorable to the Dry Press process and will be pleased to receive correspondence or circulars from manufacturers of Dry Press machinery and also would like to correspond with experienced burners relative to the best kilns, etc.

Jonathan Creager's Sons, of Cincinnati, note the following recent shipments of Grand Automatic Brick Machines to J. Geo. Stamm, Butler, Pa.; E'ville Pressed Brick Co., Evansville, Ind.; Chas. Kuntz & Sons, St. Louis, Mo.; Jno. Stuckenberg, St. Louis, Mo.; Pach & Clark, Syracuse, N. Y.; Jno. Gale, Henderson, Ky., and Geo. H. Bruns, Brecon, Ohio.

Our well known contributor and genial friend, D. V. Purington, of Chicago, has been honored by election to the Presidency of the Builders' and Traders' Exchange of that city. We congratulate Mr. Purington on his preferment, for it is indeed a high compliment, and the Exchange on its wisdom in selecting for an executive one whose integrity and ability will not only reflect credit upon himself but the Exchange as well.

C. W. Raymond & Co., of Dayton, O., report that orders are coming in daily for their Perfection Brick Press and ornamental outfits. Among recent shipments made are those to New Orleans, La., St. Joseph, Mo., Crystal Springs, Miss., Sherman, Tex., South Riverside, Cal., etc. There is also a great demand for their New Automatic Dumping Car, large shipments of which have recently been sent South, a large firm in Augusta, Ga., having ordered fifteen.

TRADE LITERATURE,

An attractive catalogue has just been received from Mess. C. & A. Potts & Co., of Indianapolis, describing their Clay Disintegrators, Stock Brick Machine and Brick Mold Sander. The latter being a new but well tested candidate for trade favors. The title page of this catalogue is very suggestive representing the old-time and modern methods of tempering clay and making brick. They will be pleased to send a copy to any of our readers.

Bennett Bros. & Co., of Wellington, Ohio, have favored us with a copy of their handsome new catalogue of the well-known Quaker Brick Machine. The catalogue is unique in some respects being printed in three colors with the title page in gold. Write for a copy, mentioning the Clay-Worker.

Fletcher & Thomas, of Indianapolis, are out with a new 36 page catalogue of Brickmakers' Supplies. It is a very neat publication and contains much matter of value to the craft. A copy will be mailed free to any brickmaker. Write them for a copy.

P. K. Dederick & Co., of Albany, New York, who manufacture Dederick's Steel Case Bailing Presses as well as a line of Brickmakers' Supplies, have published a neat pamphlet illustrating and describing same and will send copy to anyone applying for same.

A NEW HOME FOR THE "GRAND AUTOMATIC."

While in Cincinnati recently we visited the shops of Jonathan Creager's Sons, manufacturers of the Grand Automatic Brick Machine, etc., and found them busy as bees getting out machinery for spring orders.

This enterprising firm have for some time been hindered in their work for want of sufficient room, having outgrown their present quarters which they could not well enlarge. The demand for their clay working machinery has increased to an extent that has compelled them to provide better facilities and to this end they are now completing a new two-story brick factory and machine shop two doors east of their present works which they hope to occupy by the 15th of February, after which date they will keep "open house" the year round to all who are interested in brickmaking.

The new factory will be equipped with the best of modern machinery and every convenience for the rapid and economical construction of their specialties thus enabling them to meet the demands of the trade for good, strong, well made machinery promptly and at reasonable prices. Their office will be located on the first floor of the new building, which, by the way, presents a very attractive appearance to those who appreciate good brick work being constructed of front and ornamental brick from the kilns of the Aurora (Ind.) Brick Co. We are pleased to observe this evidence of Messrs. Creager's Sons' prosperity but are not surprised by it for they have displayed a degree of enterprise and energy that seldom fails to command success.

STILL THEY GO.

The Wallace Manufacturing Company yesterday shipped two of their machines—a "Big Wonder" went to Chicago, and a "Little Wonder" to New York. The demand for these machines is increasing every day, and it has grown beyond the capacity of the shops to construct them as fast as called for. A full force of hands are employed and they work from 7 o'clock, A.M., until 10 o'clock, P.M. The News a year ago predicted that in time the shops would have to be greatly enlarged and that time has about arrived. We will prophesy that before January 1st, 1890, the concern will be working two hundred hands.—*Frankfort News.*

Half a Million Strangers.

Between four and five hundred thousand people are expected in Washington for the inauguration ceremonies, and the Inaugural Committee on Public Comfort, in view of arrangements already made, announces that it can accommodate them all. The Pennsylvania Lines for this occasion will place in service their entire equipment, running through cars from all principal points, and rules have been adopted that will ensure their prompt, safe and satisfactory movement. The side-tracks and yards at Washington will be kept clear in order that trains may run in and out on schedule time. For full information regarding the cheap excursion rates and other matters apply to the nearest passenger or ticket agent of the Pennsylvania Lines.

TO THE MARDI-GRAS

At New Orleans.

Tickets to New Orleans and return via the Queen and Crescent Route will be on sale at all principal ticket offices in the East, West, and North, from February 25th to March 3d, good returning until March 23rd, 1889, at $21.00 for the round trip from Cincinnati.

Trains of the Queen and Crescent Route leave Grand Central Depot, Cincinnati, at 7:55 A. M. and 8:00 P. M., every date entire train, baggage car, day coaches, and sleeping cars run through without change. Eight hours quicker and 94 miles shorter than any other line—time 27 hours. For space in Sleeping Cars or rates from your nearest station, address D. G. EDWARDS,

Gen. Pass. & Tck. Agt.,
Cincinnati, Ohio.

Literary Note.

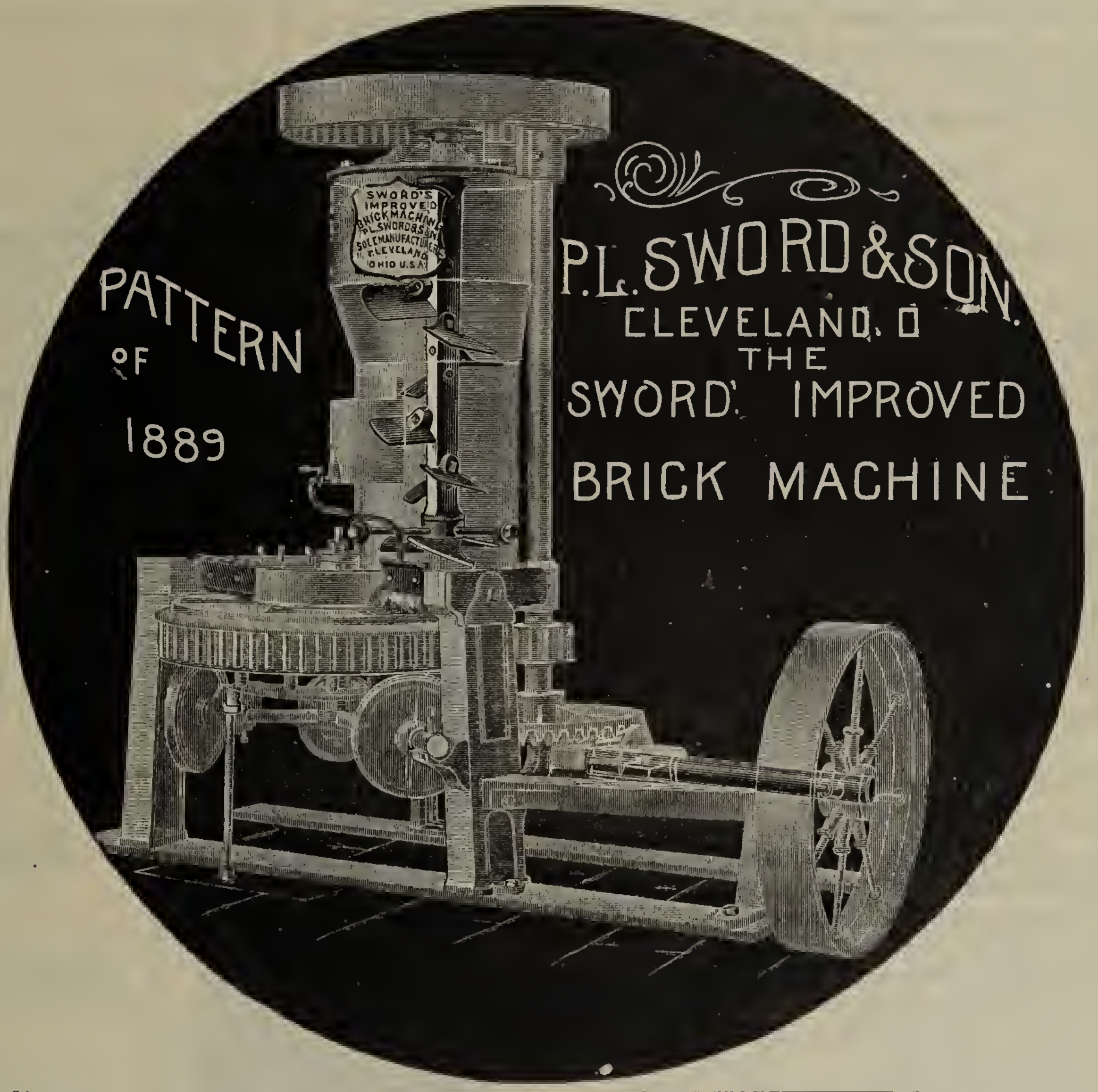
An early number of the Century Magazine will contain an exquisite little dialect poem entitled "De Jingle ob de Bells on de Cows," from the pen of Edward A. Oldham, the well known Southern journalist, whose contributions to current literature are familiar to most readers. Mr. Oldham is the author of a number of dialect stories, sketches and poems which are to be published shortly, and which have been pronounced by competent critics to contain more elements of interest and merit than anything of the dialect school published in late years. By life-time contact and observation he has grown thoroughly familiar with the negro character in all of its picturesque phases, and startling peculiarities, which, aided by remarkable powers of description and a rich flowing style, he has been enabled to produce some charming descriptive sketches, and dialect creations in prose and verse, that will afford entertainment to a wide circle of reades wherever artistic word painting and literary genius have their votaries.—*New York Journalist.*

THE INAUGURATION.

Wisdom of the Pennsylvania Lines in Arranging for the Traffic to Washington.

The number of visitors to Washington for the inauguration of President-elect Harrison is expected to exceed the number in attendance at any similar previous event. The great railway companies whose lines lead into Washington are vieing with each other in preparing for the enormous traffic. The The Pennsylvania System owns over two thousand passenger coaches, more than any other railway system in the country, and the requisite number of locomotives for their movement. This extensive equipment, together with Pullman Vestibule Sleeping and Parlor Cars, will be at the service of the pilgrims to the Capitol. The prompt movement of the Pennsylvania trains is ensured by the excellent road-bed and precision of the methods of operation. The Pennsylvania Lines propose to accommodate their patrons by selling excursion tickets at cheap rates and running trains in safety and on time, through from all principal points. The Inaugural Committee on Public Comfort has made preparation for the accommodation of half a million visitors during the ceremonies, and there is no question that people will fare well by placing themselves in the hands of this committee. For full information write or make personal application to the nearest passenger or ticket agent of the Pennsylvania Lines. It will be well to remember that the spacious depot of the Pennsylvunia Lines in Washington is just off Pennsylvania avenue, almost within a stone's throw of the Capitol, and near all places of interest. The Pennsylvania road on its way to Washington leads through the famous and ever beautiful scenery of the Allegheny mountains.

We are indebted to the Avery Stamping Co., of Cleveland, O., manufacturers of Seamless Steel Elevator Buckets for a package of blotters. They are both ornamental and useful. Thanks.


PATTERN OF 1889
P.L. SWORD & SON.
CLEVELAND, O.
THE SWORD'S IMPROVED BRICK MACHINE
SWORD'S IMPROVED BRICK MACHINE P.L. SWORD & SON SOLE MANUFACTURERS CLEVELAND OHIO U.S.A.

WILLIAMS' Cyclone Pulverizers, 36, 40 and 48-in. diameter.
WILLIAMS' Revolving Clay Screens.
WILLIAMS' Automatic Feeders and Mixers for Dry Presses.
WILLIAMS' Grinding Tables for Sizing Brick.
WILLIAMS' Clay Elevators.
WILLIAMS' Clay Conveyors.
WILLIAMS' Brick Trucks.
WILLIAMS' Clutch Pulleys for Stopping and Starting.
WILLIAMS' Friction Couplings.

Write to MILTON F. WILLIAMS & CO.,
1417 and 1419 N. 2nd St., St. Louis, Mo.

NEW ADVERTISEMENTS.

Fletcher & Thomas,
Brickmakers' Supplies.
Grand Automatic Brick Machine Co.,
Brick Machinery.
C. & A. Potts & Co.,
Clay Working Machinery.
Jonathan Creager's Sons,
Brick Machinery.
Anderson Foundry & Machine Works,
Chief Brick Machine.
J. W. Penfield & Son,
Clay Working Machinery.
C. W. Raymond & Co.,
Brickmakers' Supplies.
Skinner Engine Co.,
Steam Engines.
National Barrow & Truck Co.,
Wheelbarrows and Trucks.
Small ad's, For Sales, Wanted, Etc.

KNOWLEDGE IS POWER.

This old adage is as true to-day as in the years gone by when free schools were less numerous than now and facilities for obtaining information were as nothing compared with the present times. Hence we say to our readers get knowledge and to aid in the getting we call attention to the following offer:

THE CLAY-WORKER
and
THE DRAINAGE & FARM JOURNAL

Both one year for $1.50. It is an offer that every one of our readers interested in any way in Drain Tile or Farm Drainage should avail themselves of them.

The latter Journal (modesty forbids us speaking of the former) is the recognized authority on all questions pertaining to drainage and is crowded each month with valuable matter from able and practical writers. "Now is the time to subscribe." Address the Publishers.

QUICK TRIP TIME.

Send, brother. send with care,
Three nickels to Vick of Rochestare,
And in quick trip time you'll get from there
A book full of seeds and plants so rare.
Send, brother, send with care,
For the Floral Guide from Rochestare, (N.Y.)

Vick's Floral Guide contains a certificate good for 15 cents worth of seeds.

THE OFFICE, a most excellent journal, published from 66 Duane Street, New York, and devoted to accounting and business management has made hosts of friends for itself among the business men of the country at large. In the current issue the Editor's name, for the first time, is mentioned. The paper is conducted Mr. A. O. Kittredge, long connected with *The Metal Worker* and *Carpentry and Building*, and known to a large circle as a keen observer and a careful writer. He is assisted by a large corps of practical writers many of whom have attained eminence as accountants.

The Link Belt Machinery Co.,

New York, Minneapolis.
CHICAGO, ILL.,
11 to 23 South Jefferson St.
BURR & DODGE, Philadelphia.

MAKE

ENDLESS TROUGH CONVEYORS,
Adapted to handling (on incline) clay direct from clay-bank, or pit.

METALLIC APRON CONVEYORS,
(Sometimes called clay elevators). Adapted to feed Brick or Tile Machine.

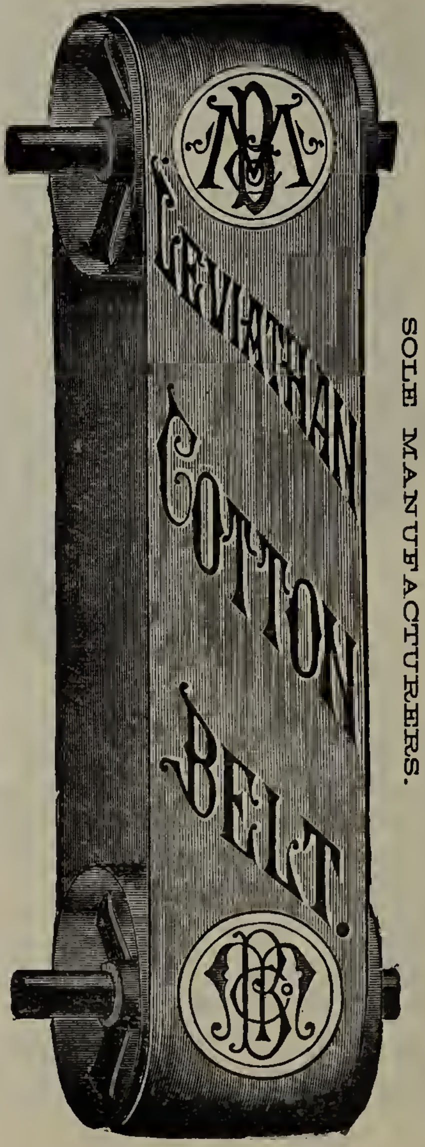
TILE ELEVATORS, (New Pattern),
Will elevate any size up to 18-inch. Send for Prices.

LINK BELT ELEVATORS (using buckets),
Will elevate Semi-Dry or Pulverized clay.

We are prepared to contract for the entire machinery required for a Complete Brick or Tile Works of any capacity.

Send for 1888 Catalogue.

(Mention the Clay-Worker.)



Main Belting Co.,

Manufacturers of the Celebrated

Leviathan Belting!

WHICH FOR

Strength and Traction Power

HAS NO EQUAL.

Specially adapted for Brick and Tile Machinery.

Unaffected by Heat, Steam or Dampness.

Send for Price List.
Samples sent on application.
Mention this paper.

FACTORY AT PHILADELPHIA.

Address,

Main Belting Co.,

248 Randolph Street, CHICAGO, ILLS.

NOTE—To any responsible party sending us measures, we will ship a "Leviathan" Belt on sixty days trial; to be paid for if satisfactory.

HARRISON CONVEYOR.
A.M. MILLER, ENG.

—FOR—

Tile and Brick Yards.

For handling Coal, Sand, Clay, Grain, Tan-Bark, Cinders, Ores, Sawdust, Lime, Cement, Shavings, Cotton-Seed, etc.

Iowa Pipe and Tile Co.,
Des Moines, Iowa, Sept. 24. 1887.

Borden, Selleck & Co., Chicago. Gentlemen—We have used the Harrison Conveyor for the past two years. It takes about 90 tons of clay per day from our dry pan and distributes it through our cellar. Gives good satisfaction. Yours Truly, IOWA PIPE & TILE CO.

BORDEN, SELLECK & CO., *Mfrs. and Sole Agents,*

Send for illustrated catalogue. **48 & 50 Lake Street, CHICAGO.**

"NEW DISCOVERY" KILN.

PIKE & SCHOPP, INVENTORS.

It Heads the Procession!

The "New Discovery" is a round down draft kiln with no grates, furnace doors, sub-arches or dampers, except at the stack, bound with iron bands, securely fastend to an arched irn door frame. This kiln is the result of years of experience by practical and successful tile and brickmakers, at a cost of thousands of dollars.

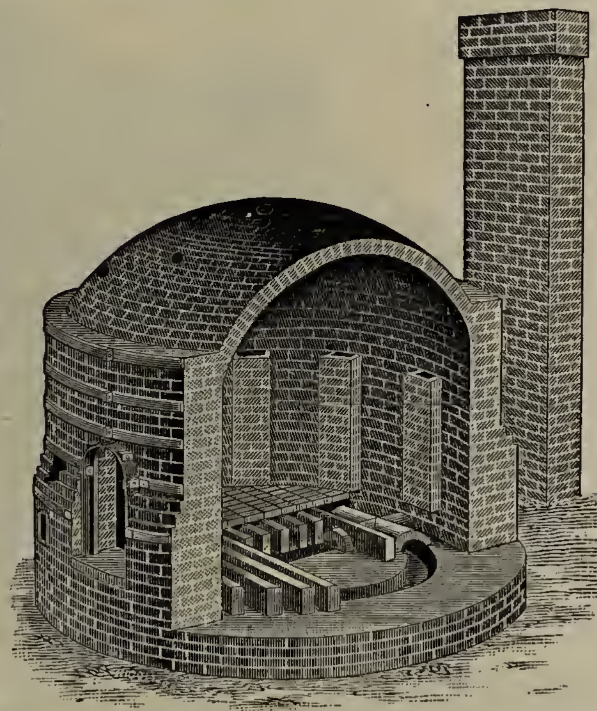
It is a conceded fact that perfect drafts and perfect combustion are indispensable to a perfect kiln. *Such* is the "New Discovery." This kiln is adapted for burning almost anything made from clay; can be constructed for either wood or coal and burn evenly throughout; is easily managed—will save in fuel, time of burning, wages of the burner, use of the kiln—nearly one-half.

The proprietors of this invention propose to sell kiln yard or territorial rights reasonably and guarantee it to be the best kiln the purchaser ever saw or used.

Everybody is cordially invited to visit our works, where a kiln is, almost, in constant operation. We also have an arched iron door frame which is indispensable to a perfect kiln.

Send for circulars and testimonials.
We shall protect our patents from infringements.
Reliable resident agents wanted. Address—

PIKE & CASTLE, Chenoa, Ills.



3000 TO 4500

Gallons of Water (per hour.)

BY HAND-POWER.

Pumps, Hand-Power Pumps

(LOUD'S PATENT.)

These pumps are simple, durable and low-priced.

A large capacity and easy working pump for **Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries,** or wherever it is desired to raise a *large quantity* of water by *Hand-power.* The pump has large valves (*accessible by hand*) and will pump water containing *sand, gravel, mud, sewage matter, etc.,* without *choking* or any *perceptible wear.*

Send for circular and price-list. Manufactured by

THE UNION HARDWARE CO.,
TORRINGTON, CONNECTICUT.

CULLS.

Why does a sailor know there's a man in the moon? He has been to sea.

A lady who advertised for a girl "to do light housework," received a letter from an applicant who said her health demanded sea air, and asked where the light-house was situated.

Anxious Mother—"Has Mr. Bashful proposed yet?"

Daughter—"Not exactly; but last evening, when I was holding little Dick on my lap Mr. Bashful went to the piano and sang: "Would I were a boy again."

Some New Definitions.

Posterity—An old lady who lives a long way off.

Life—A romance that would seem incredible were it written out.

An impromptu address—A spasm of eloquence carefully elaborated in the retirement of study.

Telegraph—A Machine for sewing words together.

Postmen—Men of letters who earn their living with their feet.—*Judge.*

Secrets of Greatness.

Ambitious Youth—Father, I am unwilling to go through life a nobody. I wish to have a name. I long to breathe the sweet atmosphere of fame. I am resolved to become great. Will you advise me?

Wise Father—With pleasure. The foundation of greatness is a good education.

"I am laying it."

"Next, you need industry and good habits."

"Yes. What else?"

"Always be polite to newspaper men."—*New York Weekly.*

Mention the Clay-Worker
When writing to advertisers
Mention the Clay-Worker.

WANTED. A pressed brick setter. Address with particulars. W. P. RICHARDSON,
North Baltimore, Ohio.
2. 1. c.

WANTED. A temperate, successful dry press brick burner; one with experience in the management of the Eudaly Kiln and natural gas preferred. Address with full particulars
W. D. RICHARDSON,
North Baltimore, Ohio.
2. 1. c.

SUPERINTENDENT—SCOTSMAN—Has thorough knowledge of all the branches of fire clay, common clay and pottery trades. Practical knowledge of modeling, moulding and burning, glazing and enameling, bricks, sinks, pottery ware, majolica ware, etc. Is equal to book-keeping. Six years in present place as superintendent. Could take a small interest in a good business. Address,
A .S., Care of "Clay-Worker."
2-1. c.

FOR SALE, WANTED, ETC.

☞ADVERTISING RATES in this column 20 cents per line, each insertion; about seven words make a line.☜

FOR SALE. One-half interest in my brick plant. For particulars address A. V. McKIRN,
1. 2. d 13 E. Levee, Kansas City, Mo.

FOR SALE. One Sword and Son Brick Machine, in good order; has been run three seasons. Will sell for $150. C. AMMAN,
1. 3. d. Decatur, Ill.

WANTED. A situation as foreman on a dry press brick yard; experienced in machinery, burning, etc. Address CHAS. BRADFORD,
1, 2. c Care Clay-Worker.

FOR SALE CHEAP. Fifty iron cars for use in drying brick or tile in tunnel dryer.
CYRUS KNAPP,
1. 3. d 339 N. Thirteenth St., Terre Haute, Ind.

WANTED. A good second-hand Brick Machine, suitable for the Denver, Col., clay. Address, with full details, T. A. HAND,
2.1c. Morris, Ills.

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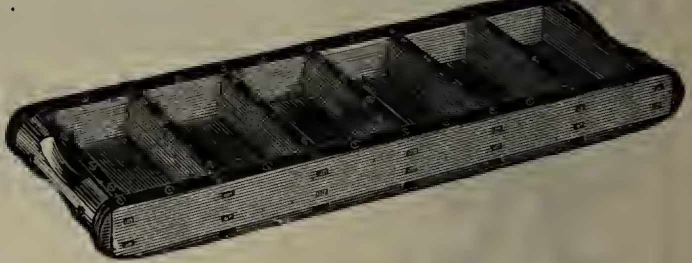

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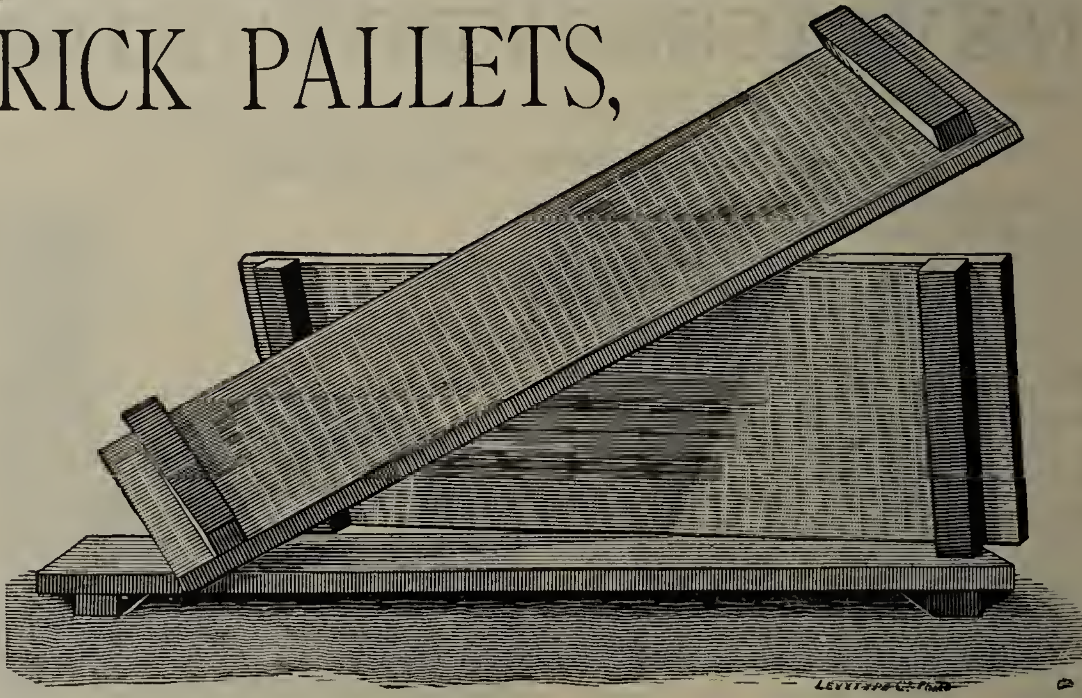

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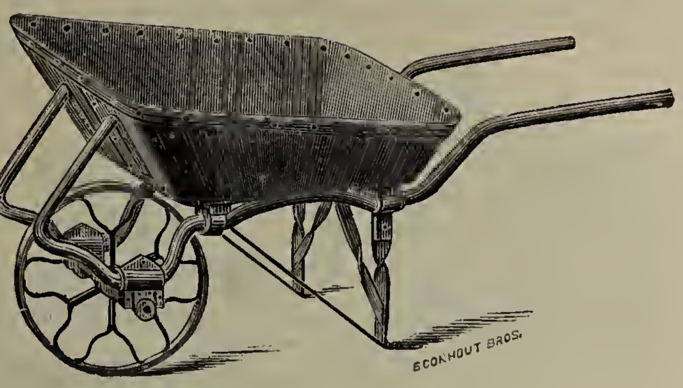
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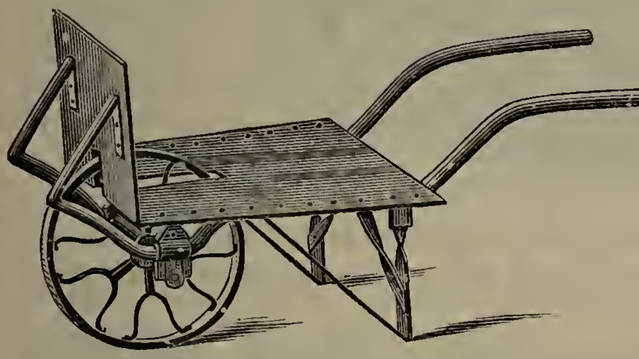

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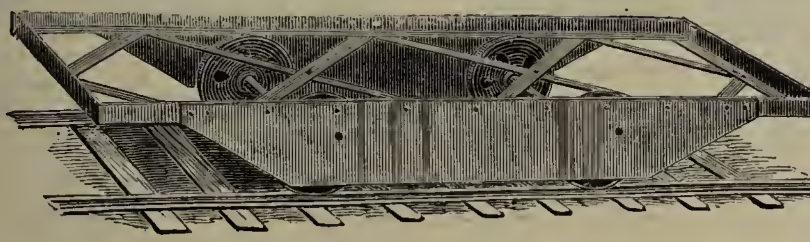

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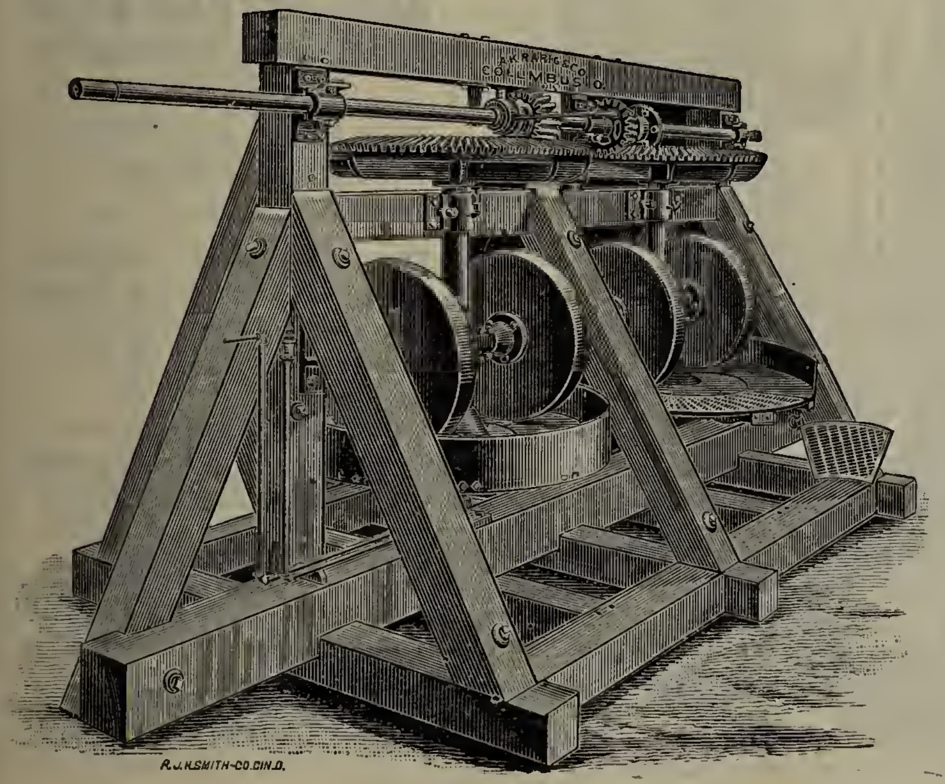
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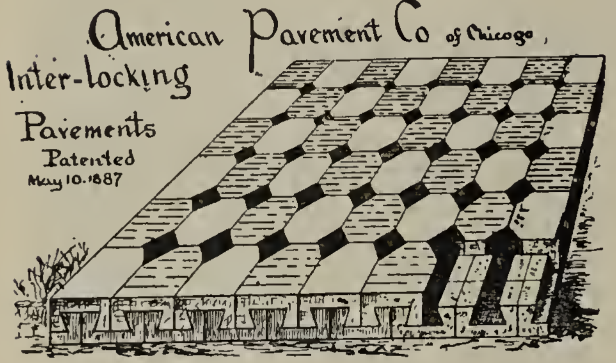

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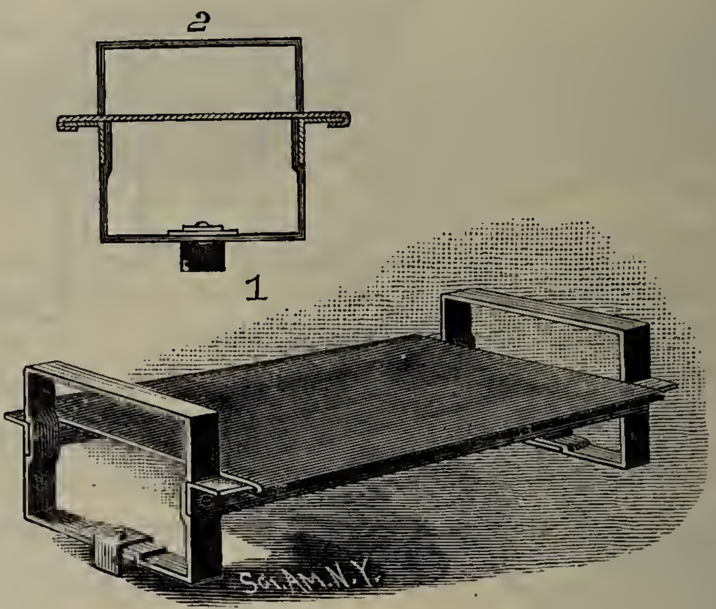

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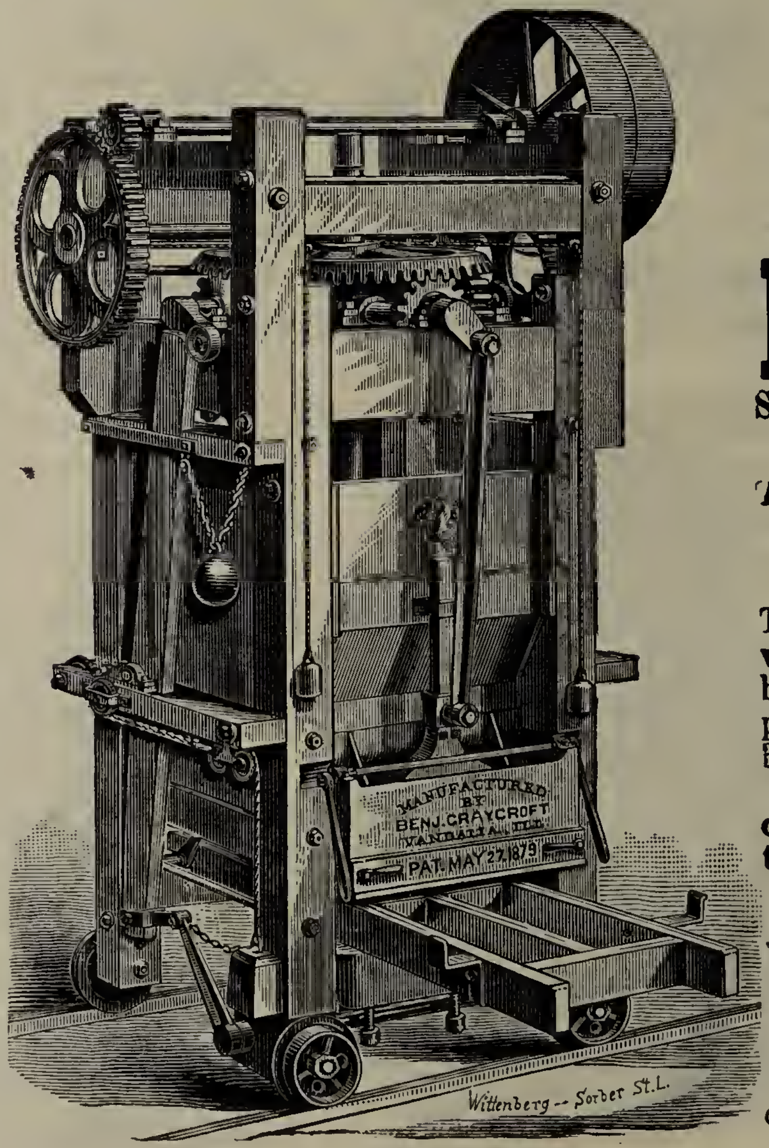

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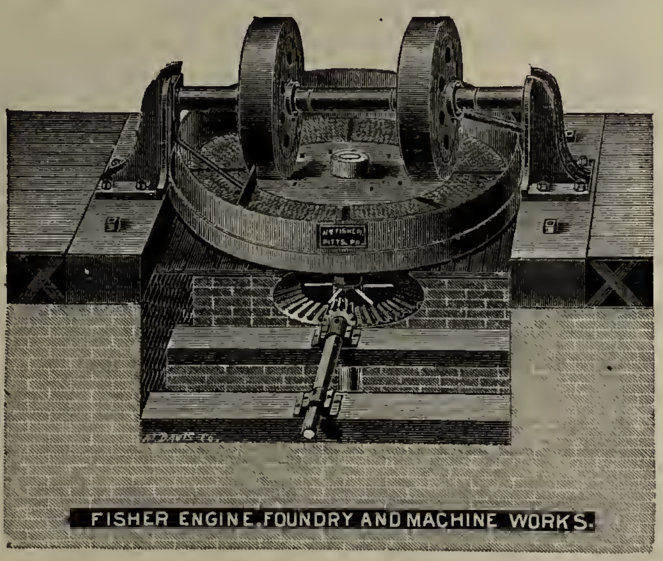
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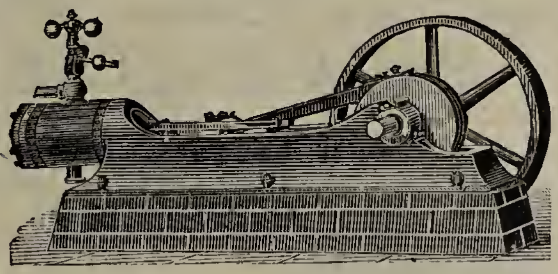

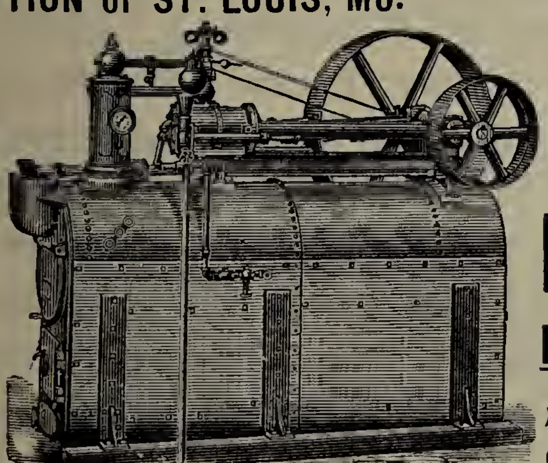

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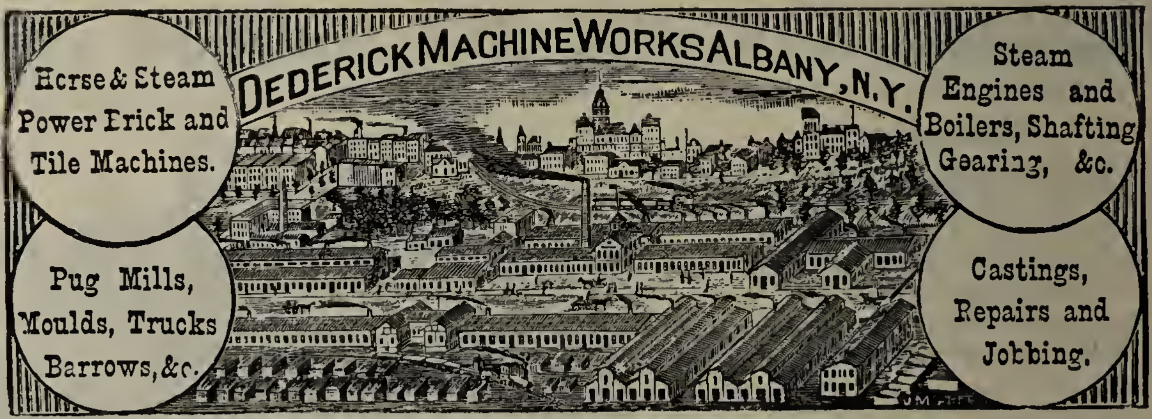
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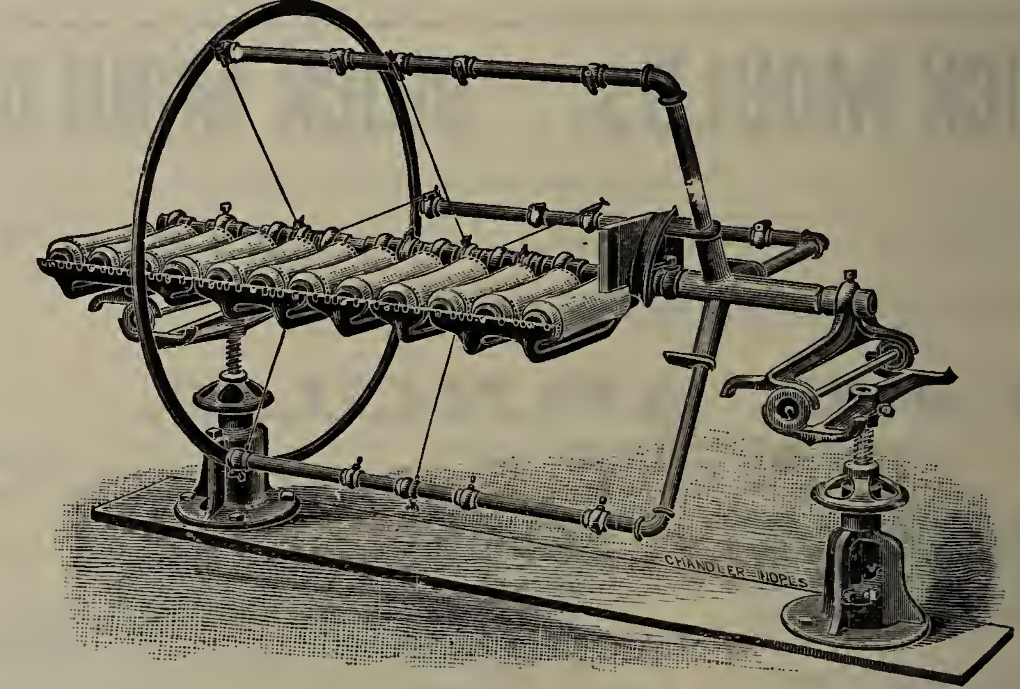

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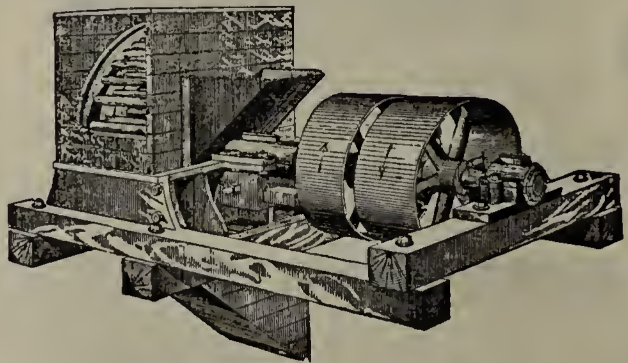

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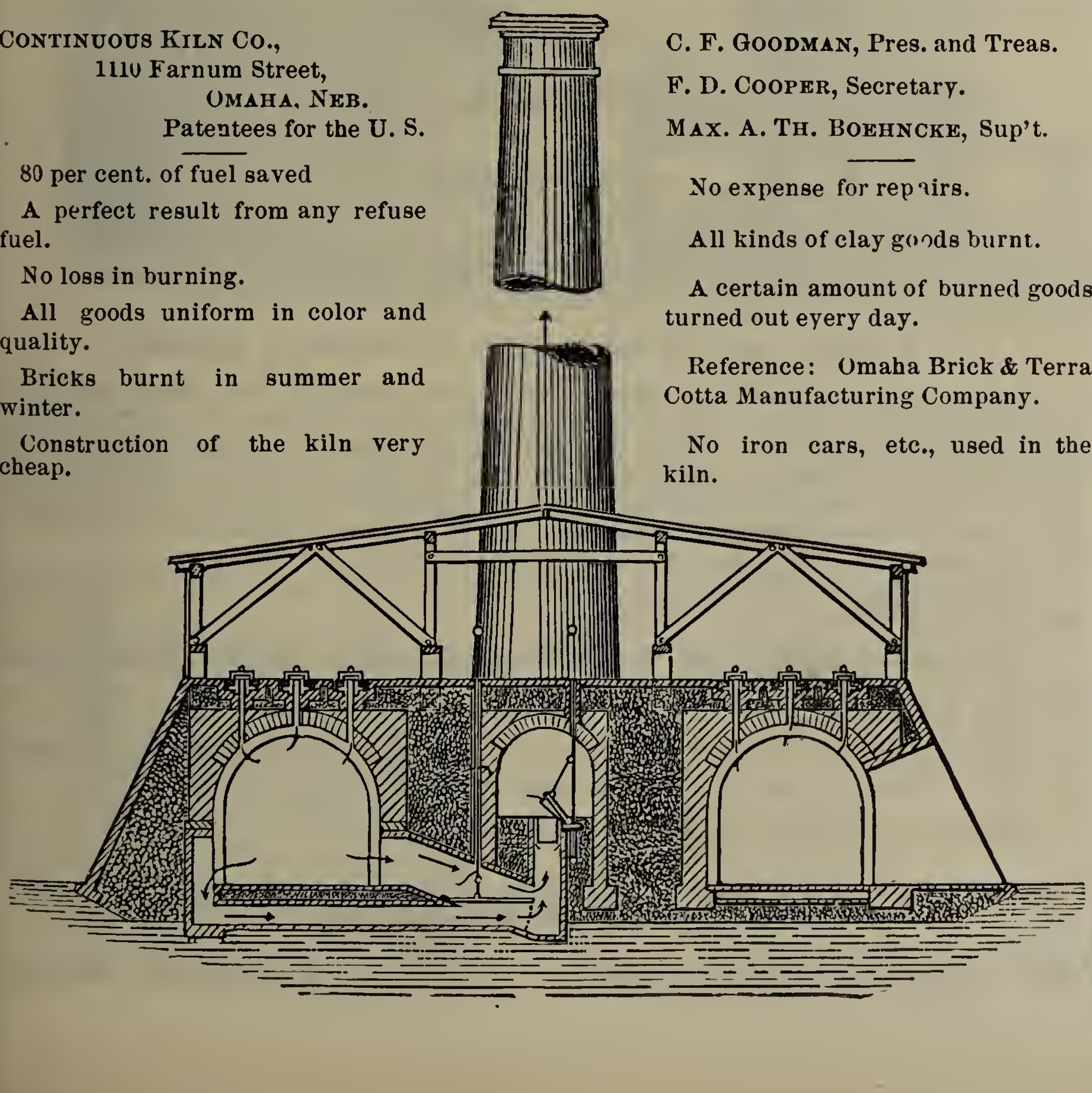

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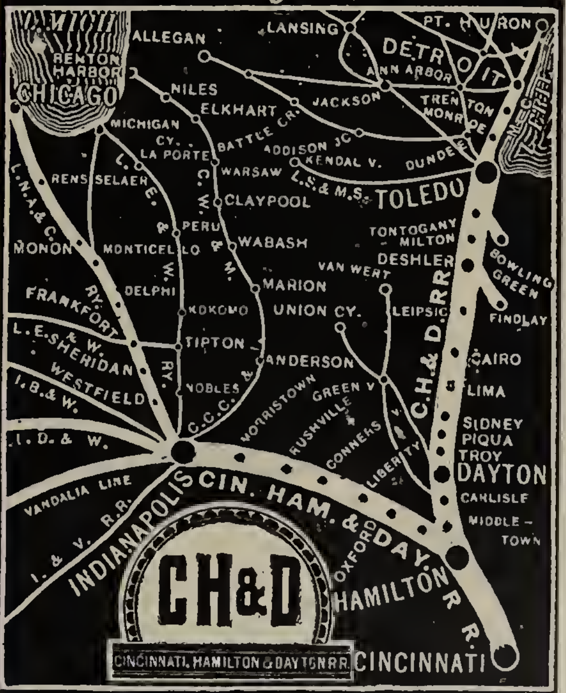

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11 40 p m	- -	" "	8 10 a m

The shortest and quickest route to St. Paul and Minneapolis, Minn., and all Northwestern points. Twelve hours saved by this route.

Pullman buffet sleepers, magnificent chair cars and through coaches on all trains.

ONLY LINE RUNNING 3 TRAINS EACH WAY

BETWEEN

INDIANAPOLIS AND CHICAGO.

I. D. BALDWIN, Dist. Pass. Agt.
E. O. McCORMICK Gen'l Pass. Agt.

26 SOUTH ILLINOIS STREET.

The GREAT I. B. & W. Route

THE SHORT LINE
Both East and West

The only line with solid trains to Bloomington and Peoria with Through Cars to principal Missouri River points in several hours less time than any other line. Also through Sleeping and Reclining Chair Cars via Danville to Chicago, making as quick time at lower rates than any other route. The short line to Springfield, Columbus, Ohio, and all points in Southern and Eastern Ohio. The Quickest and Only Route with Through Chair Cars to Urbana, Ohio, Bellefontaine, Kenton, Tiffin and Sandusky. The authorized differential route East with Quick Time and Through Tickets to Principal Eastern Cities from $1.00 to $1.50 less than regular rates. Trains at Indianapolis Union Depot

Leave	Going East	*4.10 a.m.	11.00 a.m.	*9.00 p.m.
	" West	*7.30 a.m.	3 30 p.m.	*11.00p.m.
Arrive	From East	*7 00 a.m.	3.15 p.m.	*10 40 p.m.
	" West	*3.50 a.m.	10.40 a.m.	*8.40 p.m.

*Daily.

All trains have the finest of Buffet Sleepers and Reclining Chair Cars. For tickets and full information apply to Geo. Butler, Gen'l Agent, at the Union Station. 42 and 44 Jackson Place, (opposite main entrance Union Station,) Indianapolis, or to any Agent on the line.

Look in local column for special notices of excursions, reduced rates, etc.

H. M. BRONSON, Gen'l Pass. and Ticket Agent
B. C. KELSEY, Ass't Gen'l Pass. Agt., Indianapolis.

Economy Portable Brick Hake.

Patented Sept. 22, 1885, Re-issued Feb. 23, 1886. By
M. WALKER and E. MINER, Yankton, Dakota.

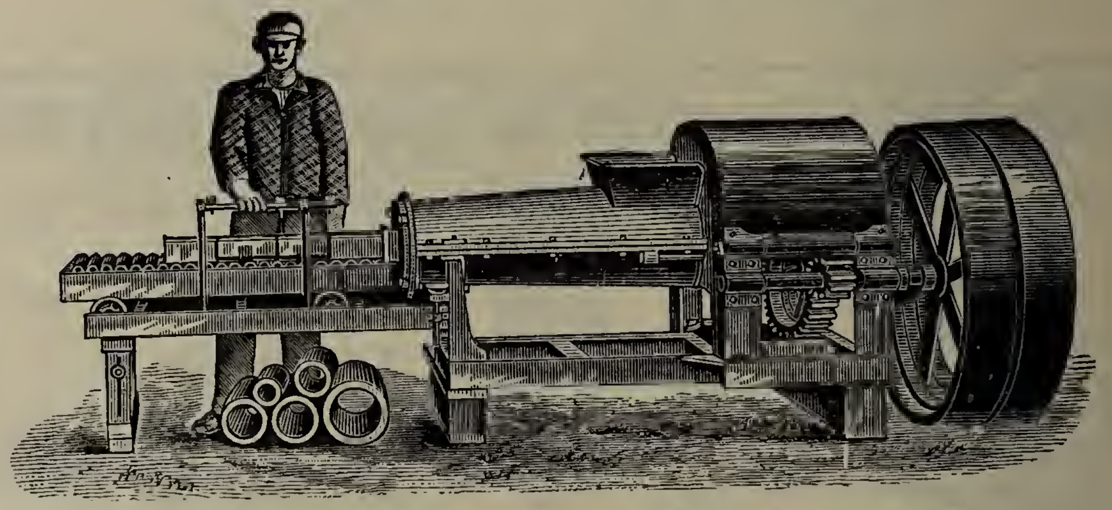
We desire to call the attention of all brickmakers to our PORTABLE BRICK HAKE, which certainly furnishes the cheapest and best means of handling brick from the macnine to the yard, and from the yard to the kiln ever yet made use of. By this device the brick when taken from the machine are placed directly upon the haking boards, and when filled the haking boards are taken up by the truck and conveyed to the yard, where they are set down in rows end to end, where they remain until dry, when the truck comes again, picks up the hake of brick and takes it to the kiln. Thus one man does the work of four and the bricks go into the kiln in much better shape by not being handled while they are soft. We have a truck made especially for handling soft molded bricks on pallets. Yard County and State rights for sale. Please address for circulars and for further information,

YANKTON PRESSED BRICK CO.,

Or either of the undersigned, patentees,
M. WALKER, or E. MINER, Yankton Dakota.

KELLS & SON'S IMPROVED
Brick and Tile Machines!

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of Brick and different sizes of Tile by changing dies. For strength and durability we except none. We chalenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22, 1880; and February 12, 1884. We can furnish Crushers and also Trucks.

We can produce side cut Brick with our down cut-off, and make perfect edges and corners without the use of water or oil.

We have had Twenty-two Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 18 inches and on our No. 2 Machine we can make tile from 2¼ up to 12 inches

☞For Illustrated Circulars, Prices, etc., address

KELLS & SONS,

SHOP NEAR NEW COURT HOUSE. ADRIAN, MICH.

The Corey Car and Manufacturing Co.,

—o—CHICAGO.—o—

BUILDERS OF DUMPING CARS

——FOR——

Hand or Steam Shovel Service,

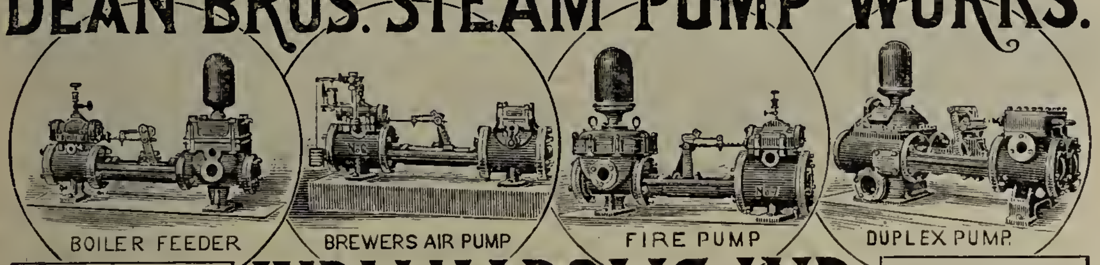
——FOR——

Brick Makers, Tile Works, Etc.

Light T Rails, Portable Track, Portable Turntables, Etc., Etc.

Send for Circulars.

DEAN BROS' STEAM PUMP WORKS.



PUMPING MACHINERY FOR ALL PURPOSES.

INDIANAPOLIS, IND.

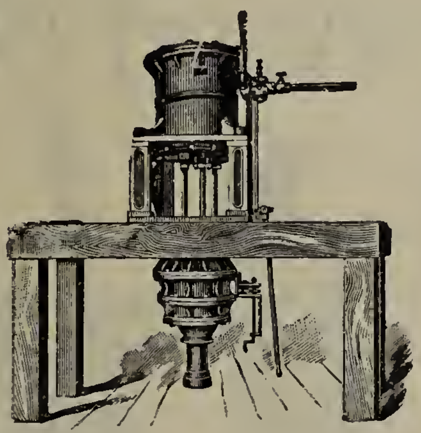
SEND FOR CATALOGUE AND PRICES.

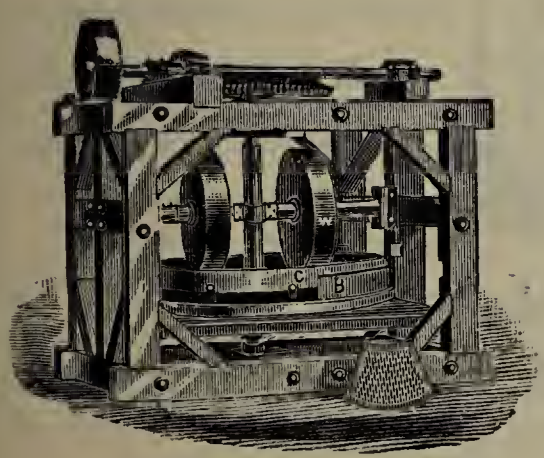
STEVENSON & CO.,

MANUFACTURERS OF

Steam Sewer Pipe Presses,
Dry Pans For Grinding Clay,
Wet Pans for Tempering Clay,
Pug Mills and Engines,
and All Kinds of

Brick & Terra Cotta Machinery.





Parties going into the Sewer Pipe Business will do well to correspond with us in regard to Machinery, as we manufacture COMPLETE OUTFITS FOR SEWER PIPE AND FIRE BRICK WORKS.

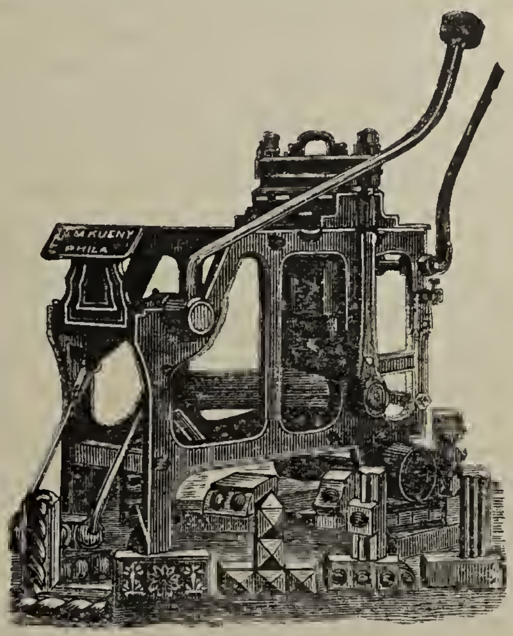
Write for Circulars.

STEVENSON & CO.,
Wellsville, Ohio.

N. M. KUENY,

MANUFACTURER OF

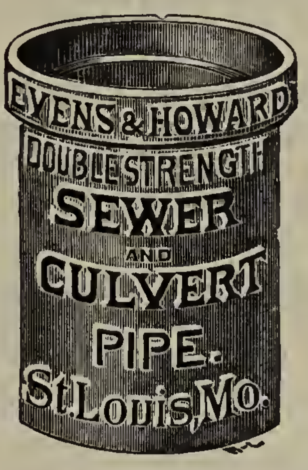
Brick Presses



Cor. 21st and Point Breeze Avenue,
PHILADELPHIA.

Pennington Ave. and Reservoir Street
TRENTON.

Largest Pipe Works in U. S.



Culvert Pipe,

Railroad Standard

SEWER PIPE,

St. Louis Regulation.

Write or testimonials. See our circular: 'Culvert Pipe, Its Uses and Advantages."

EVENS & HOWARD,

916 Market St., **ST. LOUIS, MO.**

Manufacturers of Fire Brick and all kinds of Fire Clay Goods. Send us your orders if you want them filled promptly.

THE PRINCIPAL AND BEST ROUTE
TO THE WEST IS

The Vandalia Line,

And the reason for it being is apparent to all those who travel between the East and the West. Its trains run solid from Indianapolis to St. Louis, and the service is conceded to be unequalled. Comfortable day coaches, that are kept tidy and clean, handsome and elegantly furnished parlor cars with easy sofa chairs go to make the trip from Indianapolis to St. Louis a pleasure rather than a hardship. Pullman sleeping cars are run on day and night trains, a local sleeper is also run for the convenience of local travel between Indianapolis and St. Louis, and passengers can get into the car at or near the Union Station any time after 8:30 P. M., and will not be disturbed until St. Louis is reached at 7:00 A. M. Rates are always as low as by less important routes. Through express trains run as follows: Leave Indianapolis 7:30 A.M., 11:55 A. M., 11:00 P. M. Arrive St. Louis, 5:00 P. M., 7:30 P. M. and 7:00 A. M., respectively.

Before making arrangements for a western trip, be sure to write or call upon

H. R. DERING,
Ass't Gen'l Pass. Agent, Vandalia Line,
48 W. Washington St.,
INDIANAPOLIS, IND.

Queen & Crescent Route.

(Cin. Southern and Associate Roads.)

DIRECT

AND

Most · Picturesque · Route

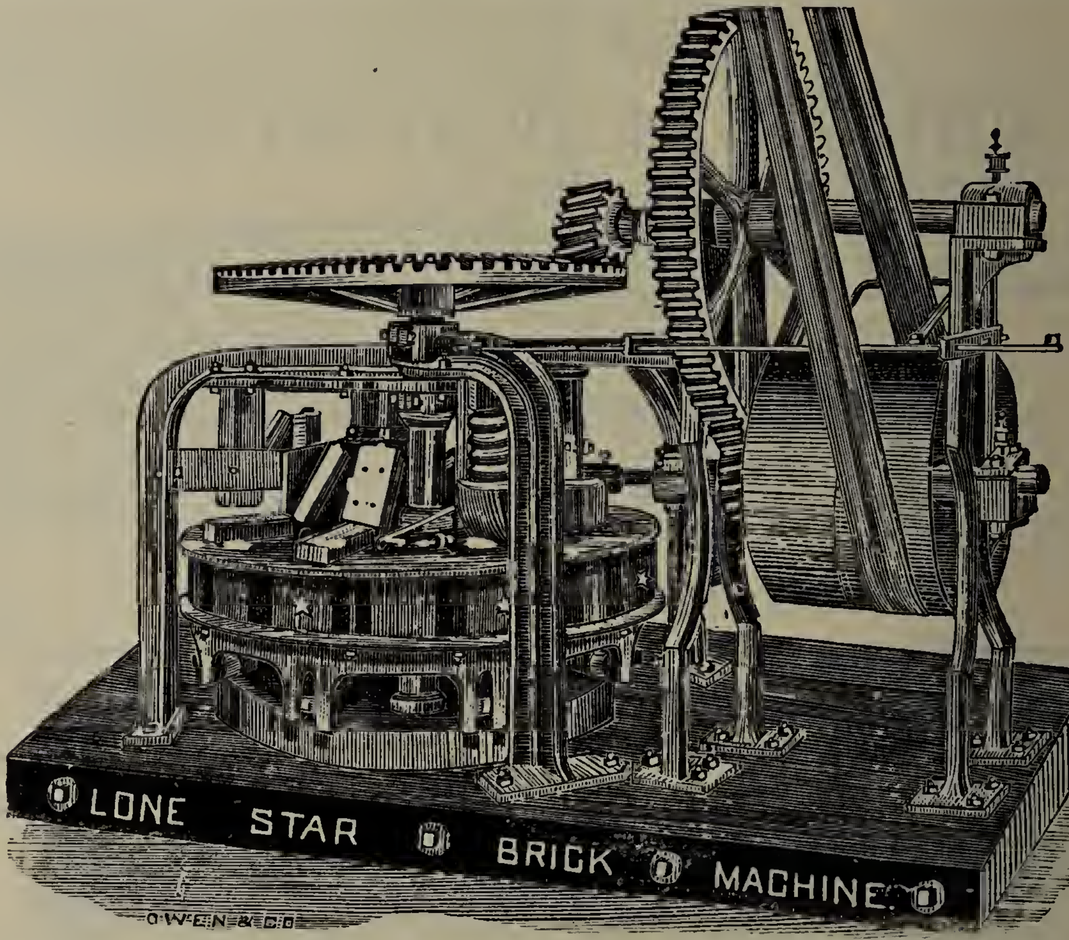
SOUTH.

DOUBLE DAILY SERVICE OF
FAST THROUGH TRAINS
From Grand Central Union Station,
CINCINNATI,
For Chattanooga, Knoxville, Memphis, Birmingham, Meridian, New Orleans, Vicksburg, Shreveport, Mexico, Texas and California.

CINCINNATI TICKET OFFICES:
94 West Fourth Street near Vine, and Grand Central Union Station.

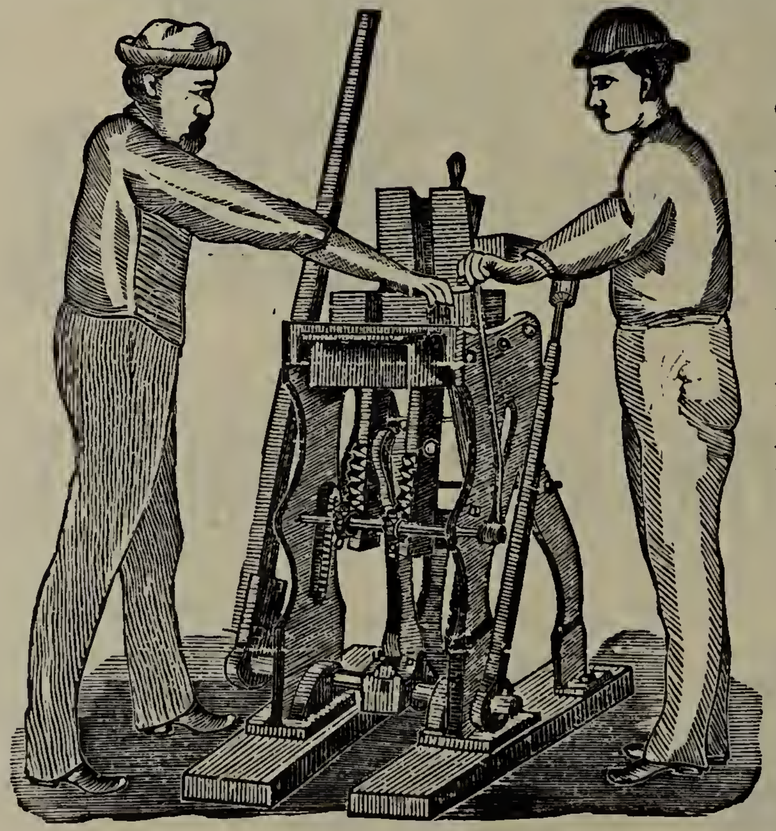
JOHN C. GAULT,
Gen'l Manager.
R. CARROLL,
Gen'l Superintendent.
D. G. EDWARDS,
Acting General Pass. Agent, Cincinnati.

The New Improved
LONE STAR PRESSED BRICK MACHINE.



This is the only Press that will work clay direct from bank in any degree of moisture from wet to dry. For Simplicity, Easy running and Fine Brick it has no equal.

THE LITTLE MAGIC WONDER
SEMI-DRY PRESS BRICK MACHINE.

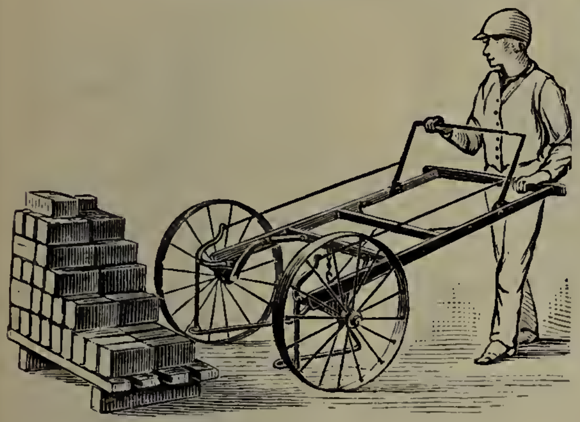


This machine works the clay in its natural state direct from bank. It is intended for small yards and will enable anyone to compete in the Pressed Brick line, with hardly any outlay. It will make as fine brick as any $5,000 machine under similar circumstances. For further particulars and circulars address

WM. THAISON,
Austin, Texas.

Catalogues will be sent only upon mention of this paper.

STEELE'S IMPROVED
Brick Truck
—AND—
Portable Hack.



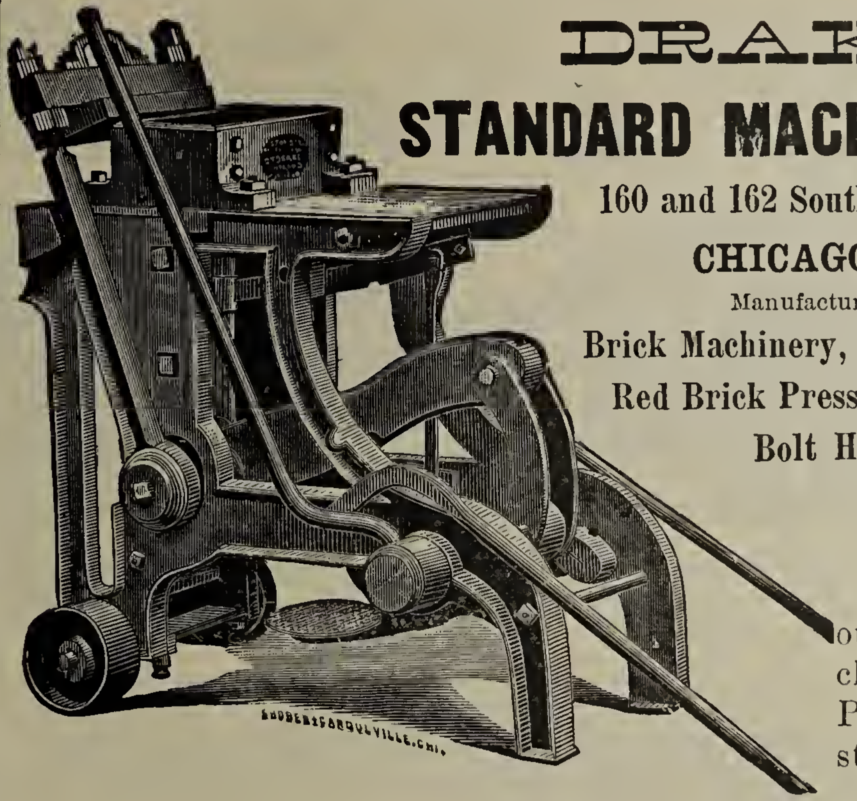
The principle of handling and drying bricks by the Portable Hack System has been perfected in this Truck and VENTILATED HACK BOARD, being the most practical Truck and method ever yet introduced, saving labor in handling and time in drying bricks. Can be used in any yard not too steep. Is especially adapted for medium dry clay machines.

☞Is fully warranted to work as represented.

Orders Solicited.

Territory for sale in the Northern and Western districts. Address,

J. C. STEELE, Patentee,
Statesville, N. C.


SHOBER&CARQUEVILLE.CHI.

DRAKE'S
STANDARD MACHINE WORKS,
160 and 162 South Clinton St.,
CHICAGO, ILL.
Manufacturers of all kinds of
Brick Machinery, Clay Crushers, Fire and Red Brick Presses, Hydraulic Presses, Bolt Headers, etc.

This cut represents our Patent Press with change of liners in same Press Box for different styles of brick.

DRAKE'S CLAY CRUSHER AND STONE SEPARATOR.

WE GIVE THESE AS REFERENCES:

Best in the market for stubborn clay and to separate stones from same. Number used by brickmakers in Chicago: Alsip Brick Co., 3; Hayt & Alsip, 4; J. B. Legnard, 2; May, Purington & Co., 1; Wahl Bros., 2; John Busse, 1; Union Brick Co., 1; Chicsgo Brick and Mill Co., 1; Weckler Brick Co., 1; Adam J. Weckler, 1; L. Weirheim & Son, 1; John Sexton, 1; Chicago Brick Co., 2.

Do You Intend Purchasing a New Brick Machine,

—OR,—

Is the Machine You Are Now Using Not Giving Satisfaction?

If so, it will pay you to investigate the merits of our **Horizontal Stock Brick Machine.** It is the only machine on the market which does not require extra pug mill *to work the clay direct from bank.* The only one which will work the clay so stiff the brick will not pitch in trucking or spread in drying. It has no light, complicated parts underneath where the sand and dirt can get on them. Every part is out where they can be kept clean and oiled. It is the strongest and most durable machine ever made. Our prices are lower than those of any Vertical Machine and Pug Mill. All machines are guaranteed to give satisfaction and erected subject to trial. We make a specialty of erecting complete plants. It will pay you to write us for prices and terms before purchasing elsewhere. We also manufacture full line of brickyard supplies, Pug Mills, Disintegrators, Mould Sanders, Trucks and Barrows.

Greenville, Mich., July 10th, 1888.

A. Potts & Co., Gentlemen—We enclose balance due on Horizontal Brick Machine. We are very much pleased with machine; it has done all you guaranteed. The brick made are perfect. Capacity only limited to our facilities for handling. We can recommend it to anyone wishing a successful brick machine. Wishing you success we are Yours Truly, F. N. WRIGHT & CO.

A. POTTS & CO.,
Indianapolis,
Indiana.

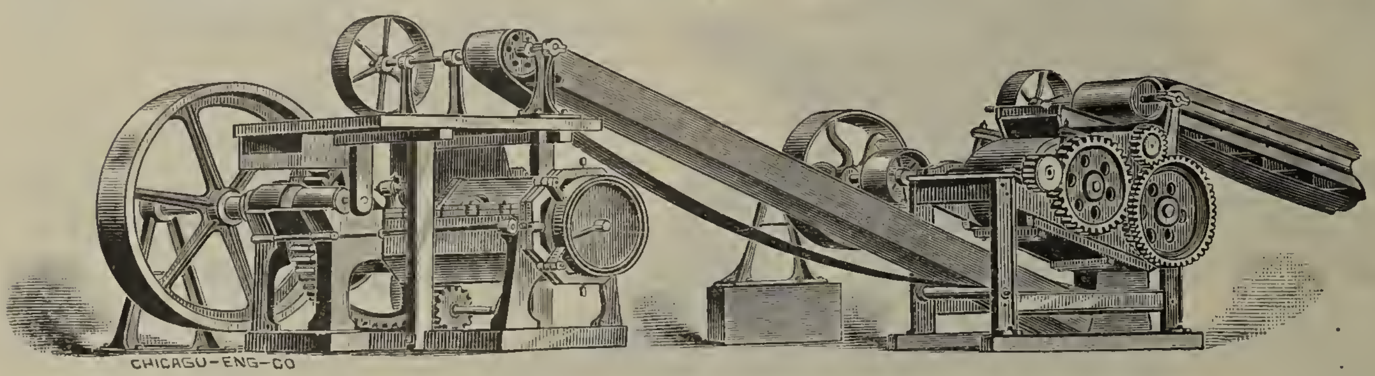
[Mention the Clay-Worker.]

Adrian Brick and Tile Machine Co., Adrian, Mich.,

—MANUFACTURERS OF—

Brick and Tile Machinery,

Clay Crushers,
Engines
and Boilers.



Also Daso's Builders' and Contractors' Elevators. Steam Fittings and Iron and Brass Castings Furnished to Order.

The working qualities of our machinery at its present state of development as estimated by one of the prominent Brick Manufacturing Companies of Kansas City, are stated in the following reply to a letter of inquiry addressed to them:

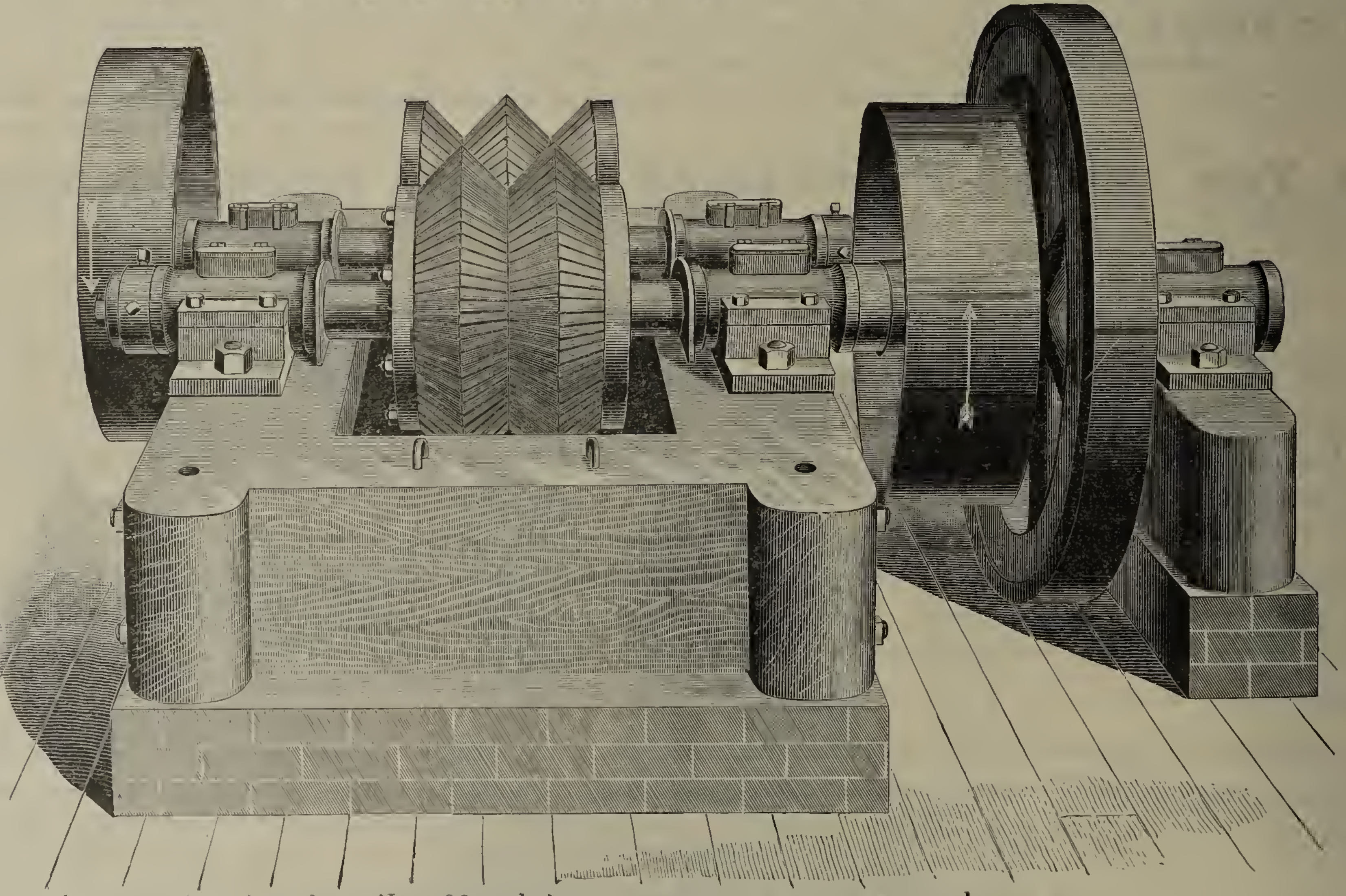
KANSAS CITY, MO., August 21, 1888.

JOHN GIBSON, Esq., Monticello, Iowa:

DEAR SIR—In answer to your favor of the 16th will say, that we do not think there is any room for improvement in the Adrian Brick and Tile Machine Co's No. 4 Cut-off Table, as it cuts the brick as near perfect as possible, without tearing the edges; thus leaving the ends of the brick as perfect as the face. We are also using the new dies on both our machines, and are well pleased with them, as they are 100 per cent. better than the old style and turn out a perfect column of clay without warping or twisting. We have two No. 3 McKenzie machines and they are doing excellent work for us and we averaged during July, 26.800 brick, each, per day. In conclusion we will say that both the new tables and the new dies are so incomparably superior to the old ones that it gives us much pleasure to recommend them.

Very truly yours, SEDDON & EDWARDS BRICK CO.

The NEWELL LATEST IMPROVED CLAY PULVERIZER IS THE BEST.



This cut shows the interior of our New 26-inch Pulverizer with hopper removed.

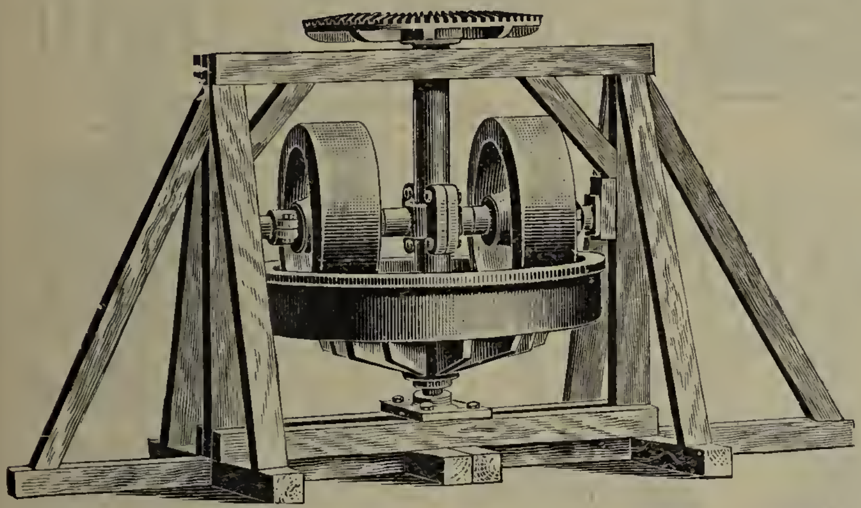
Send for illustrated circular and price-list.

NEWELL UNIVERSAL MILL CO.,

10 Barclay Street, New York.

THE FROST

Dry & Wet-Pan Crushers, Chasers, Etc.,



—FOR—

BRICK, TERRA-COTTA, SEWER PIPE AND FIRE CLAY.

—o—

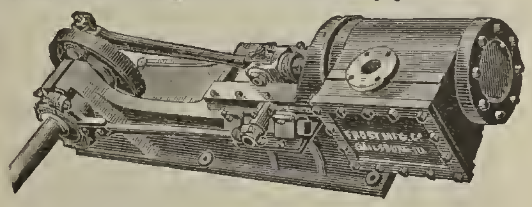
The best and cheapest machines made for working hard clay, soap stone, grog, etc.

Write for prices and other information.

THE FROST ENGINE CO.

GALESBURG, ILL.

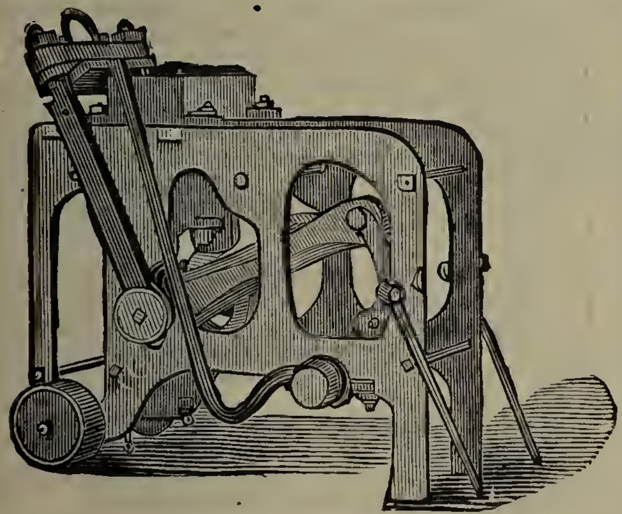
ALL SIZES UP TO 150 H.P.



ELEVATOR SUPPLIES

PULLEYS, SHAFTING, SPROCKETS, BUCKETS, BELTING, SHELLERS, CLEANERS, MILLS, &C.

SEND FOR CATALOGUES



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1819 and 1821 Germantown Avenue,
and Fifth St.,
PHILADELPHIA, PA.

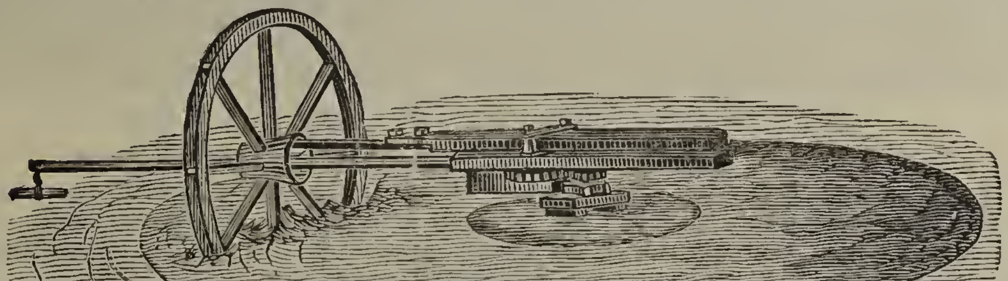
☞Send for Circular and Price-List.

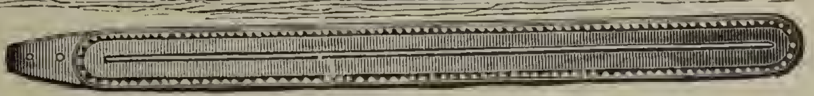
Philadelphia Brick Machine Works

—MANUFACTURER OF—

FIRE AND RED BRICK PRESSES.

Various sizes, from the smallest size up to 24 inches; also, manufacturer of **Clay Mills, Tempering Machinery,** and all kinds of **Brickmakers' Tools.**





These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and is fitted up ten per cent. cheaper. ☞Mention THE CLAY WORKER.

ESTABLISHED 1812,
AND CONTINUED ON THE SAME PREMISES EVER SINCE.

MILLER'S

BRICK PRESSES,

Introduced 1844 Latest Improved Patents, Aug. 28, 1883.

SAMUEL P. MILLER & SON,

MAUFACTURERS OF

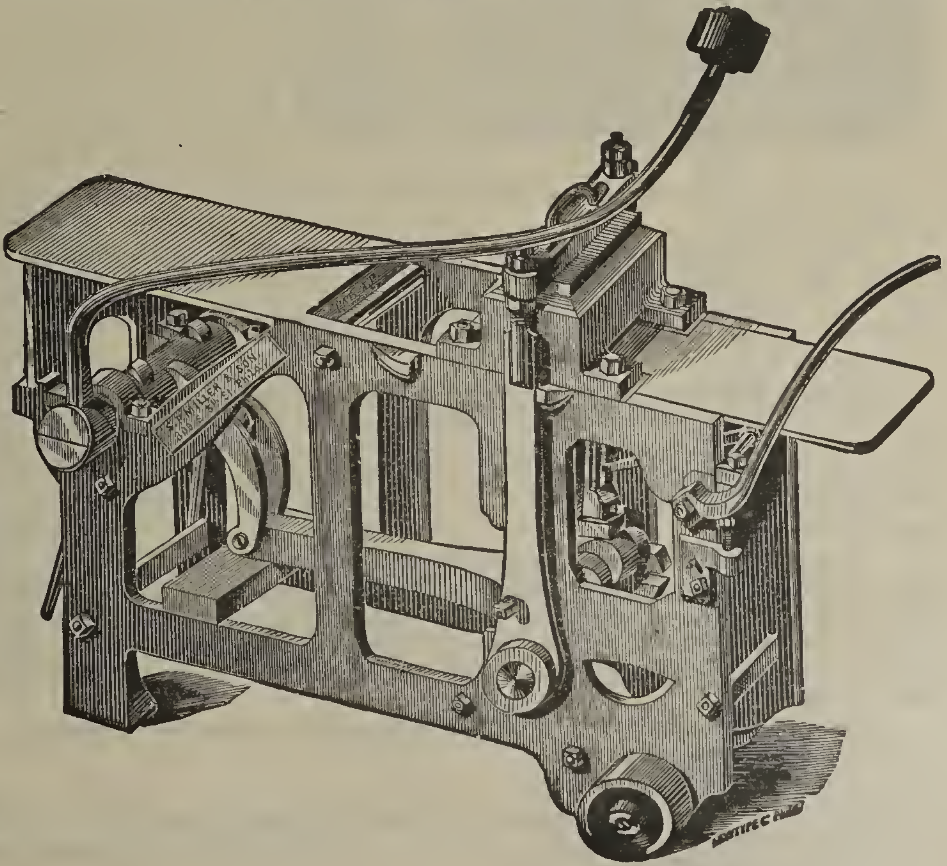
RED AND FIRE BRICK PRESSES,

Of five different styles, embodying all the improvements in Hand Brick Presses in use.

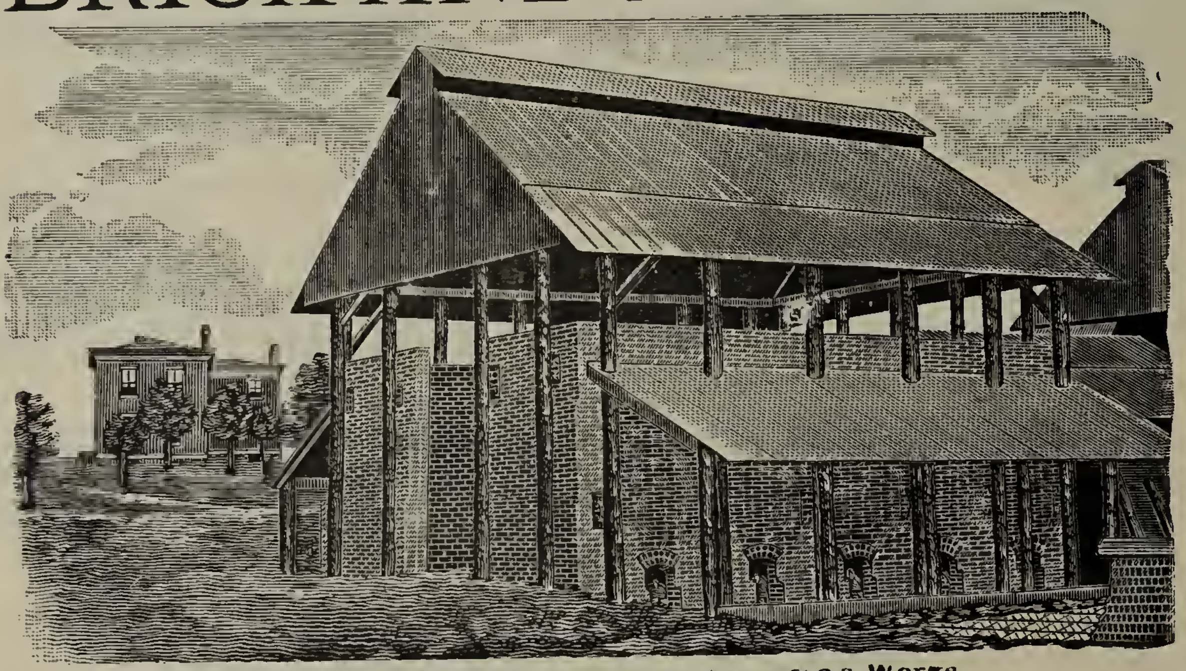
Clay Wheels with Reciprocating Rack, Kiln Castings, Brick Moulds, Clay Spades, and the Tools in General Use for Brick Making.

No. 309 SOUTH FIFTH ST., PHILADELPHIA, PA.

S. P. M. & Son refer to Brickmakers generally. ☞ Orders from abroad promptly attended to.



F. L. HALLS'
IMPROVED
BRICK AND TILE KILN.



This Cut is a Representation of the Patentee's Works.

In this invention I do not claim perfection, for progress is onward. There is no end to human achievements. This I do claim; that the quality of the bricks it turns out, is as good as the best; being nearly all hard burned brick. That it takes less time, less labor, and consequently less fuel in burning than **any** other plan of brick kiln in use, and it is easily operated.

DESCRIPTION OF BRICK KILN, AND FURNACES.

The peak holes not shown are the same as in the common case brick kilns, thus enabling one to see the state of **the arches** when burning. Fig. 1, is a front or side elevation with wall removed, which plainly shows the green brick kiln as it is built over the permanent mason work. Every bench alternately resting on the furnaces and the mason work which is the kiln floor. this floor is a perfect support to the crown of the furnaces. D. D. are the arches of the green brick kiln, B. the furnaces, b. b. the hot air chamber of flues. Fig. 2, is a horizontal section, showing the plan of the furnaces. B. represents the floor of grate surface, b. b. the hot air chambers. The way of the arrows show how the heat is circulated from the rear end of the furnace on each side horizontally in the hot air chambers, from thence vertically through the kiln floor or partition, having apertures into the arches of the brick kiln.

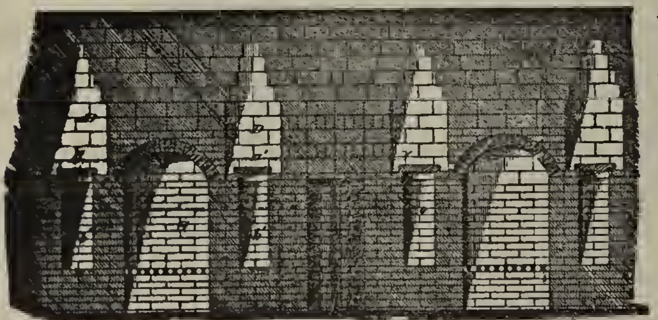


FIG. 1.

This brick kiln burns the brick of even hardness with but little fire marks. The arrangement of these furnaces are complete for perfect combustion. Also, in heating the arches of the brick kiln, there is no plan of furnaces that can equal them. The arch brick is hardly discernable and as perfect as any in the kiln.

I do not want a score of writers in their bearings to recommend this kiln *but let it stand on its own merits.* Every experienced brick maker knows that air let in through apertures at the sides or rear of furnace, it matters not in what shape, it will have a tendency to dampen the fires and cool the arches, the same will be the results, if in the rear holes it comes through the bed of coal while burning.

I have been many years engaged in the manufacture of brick, after experimenting and bringing this kiln as near perfection as it needs to be, I now offer to the brick makers yard rights, and right of terriiory, at reasonable prices, and am confident that such as may deal with me, after bringing into use this new arrangement for burning brick, will feel fully repaid for all their expenses.

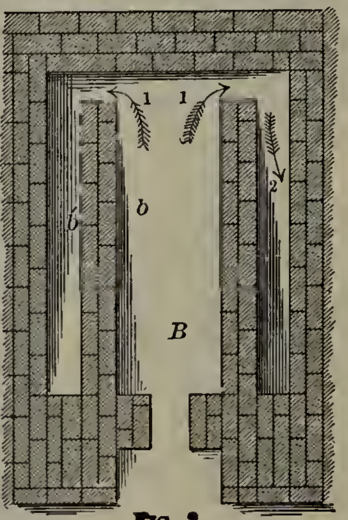


FIG. 2.

Any further information, as regards costs of Brick Kiln, construction of **Furnaces, and all particulars will be cheerfully given** by addressing

F. L. HALL, Patentee,
Oneida, Madison Co., N. Y.

THE
Pan-Handle
SYSTEM.

Its Territory, Facilities and Advantages Offered to the Traveling Public.

This system of railroads embraces the following lines: The Chicago, St. Louis & Pittsburgh railroad; the Jeffersonville, Madison & Indianapolis railroad, and the Indianapolis & Vincennes railroad.

The Chicago, St. Louis & Pittsburgh railroad is the Great Through Line to the East, via Columbus and Pittsburgh.

The Jeffersonville, Madison & Indianapolis railroad is the popular connecting link between the North, Northwest, South and Southeast.

The Indianapolis and Vincennes railroad is the direct and short line between the North, Northeast and the Southwest.

The facilities and advantages of the Pan-Handle System are in very particular in keeping with the progressive spirit of the times and the demands of the traveling public. Its facilities for the transportation of its patrons are sufficiently adequate to guarantee to all comfortable and pleasant accommodations.

The prominent advantages are its Through Coach and Sleeping Car service; Through Ticket and Baggage Check System; Prompt Connections and Speedy and Safe Transit.

Full information regarding Through Tickets, Rates and Movement of Trains can always be obtained from agents of the Pan-Handle Route.

Indianapolis offices: Union Depot and City Ticket Office, 48 West Washington St.

H. R. DERING,
Ass't Gen'l Pass. Ag't, Indianapolis, Ind.
JAS. McCREA,
General Manager, Pittsburgh, Pa.
E. A. FORD,
Gen'l Pass. Agent, Pittsburgh, Pa.

The I. D. & W. Ry.

Short Line to Kansas City and the West.

Lv Indianapolis	8.35 am.	11.00 pm. (daily.)
Ar Decatur	2.43 pm.	4.00 am.
Springfield	4.4[illegible] pm.	6.00 am.
Jacksonville	6.10 pm.	7.12 am.
Hannibal	9.35 pm.	10.40 am.
Quincy	9.50 pm.	10.45 am.
Keokuk	11.15 pm.	11.35 am.
St Louis	6.15 pm.	7.45 am.
Peoria	5.45 pm.	9.55 am.
Kansas City	7.10 am.	6.30 pm.

The only line ruuning reclining chair cars daily between Indianapolis and Keokuk, Ia., without change, running through Decatur, Springfield, Jacksonville, Chapin, Bluffs and Clayton, Ills. To Quincy, Ills,, and Hannibal, Mo., without leaving the train.

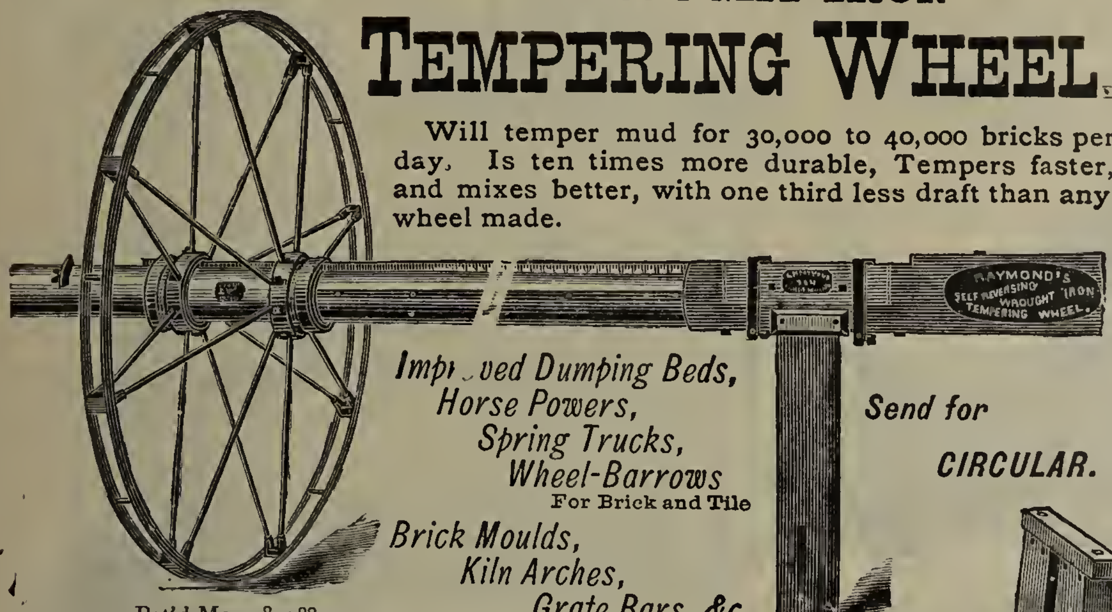
City Ticket Office, 134 South Illinois Street, Indianapolis.

H. A. CHERRIER, Ticket Agent.
JNO. S. LAZARUS, Gen'l Freight and Ticket Agent.

RAYMOND'S

WROUGHT IRON TEMPERING WHEEL.

Will temper mud for 30,000 to 40,000 bricks per day. Is ten times more durable, Tempers faster, and mixes better, with one third less draft than any wheel made.

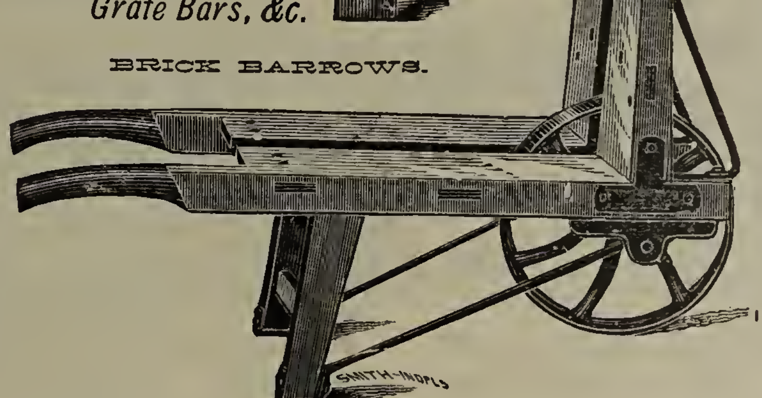

RAYMOND'S SELF REVERSING WROUGHT IRON TEMPERING WHEEL.

Improved Dumping Beds,
Horse Powers,
Spring Trucks,
Wheel-Barrows
For Brick and Tile
Brick Moulds,
Kiln Arches,
Grate Bars, &c.

Send for CIRCULAR.

Pat'd May 18, 1880.

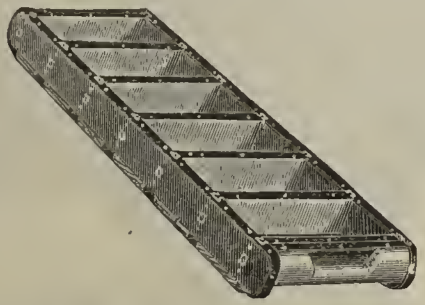
BRICK BARROWS.



Our Barrows are made from the best of seasoned white-oak, braced in front and cross braces underneath; iron wheel and axle and three coats of paint; the frame is morticed throughout. They will stand the rough usage of the brick yard. For strength and durability they have no equal.

BRICK MACHINE MOLDS.

We manufacture a great number and variety of molds and with improved machinery, we are able to fill orders with dispatch. Our molds are made of the best of cherry wood with side pieces gained for partitions and each partition is in turn dovetailed into the sides. **They are thoroughly iron bound.** The cross-irons being dove-tailed. Without doubt, the most substantial mold made.



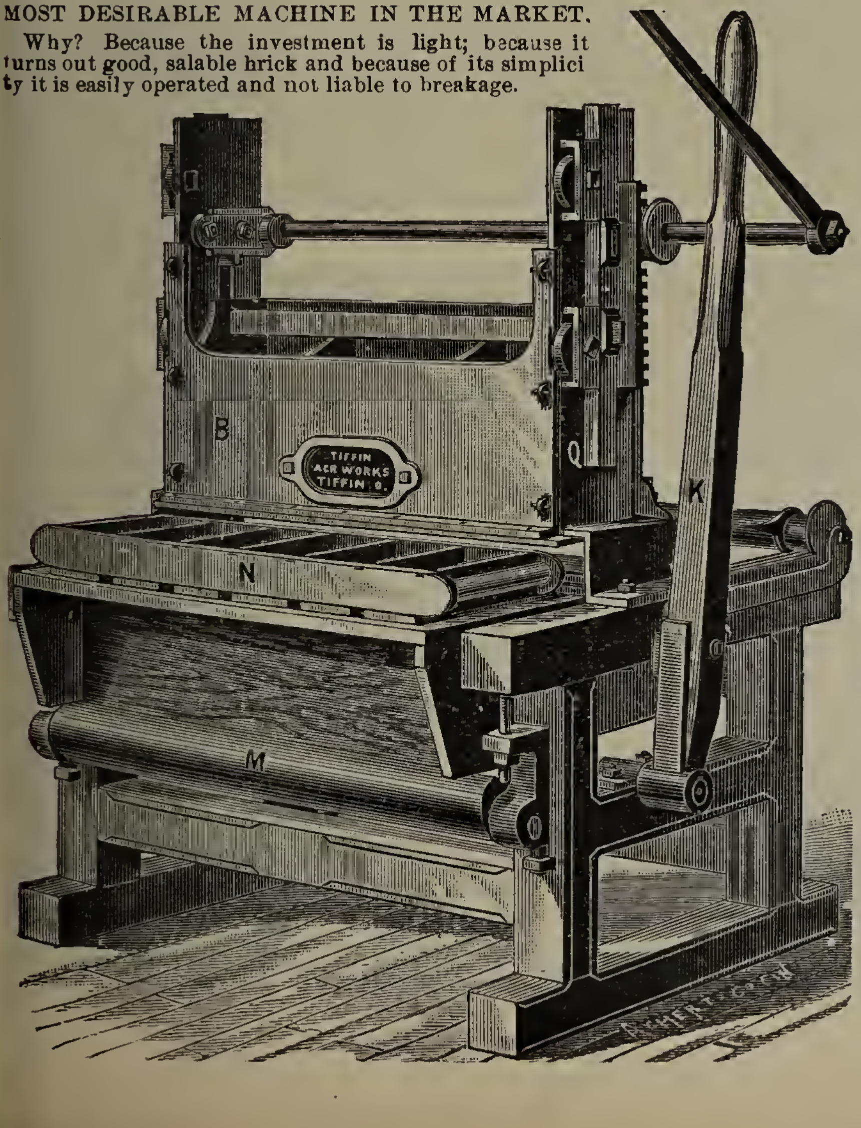
C. W. RAYMOND & CO.,

7 & 11 WAYNE STREET, (Mention Clay-Worker.) DAYTON, OHIO.

THE LATEST IMPROVED OLD "RELIABLE" BRICK MACHINE.

MOST DESIRABLE MACHINE IN THE MARKET.

Why? Because the investment is light; because it turns out good, salable brick and because of its simplicity it is easily operated and not liable to breakage.


TIFFIN AGR WORKS TIFFIN, O.
B
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K
N
M

The Best, Cheapest and Most Durable.

We have no hesitancy in claiming that the "OLD RELIABLE" when properly handled will easily be capable of producing

10,000 to 15,000 Good Square Brick per Day.

To get it to its full capacity it should be used in connection with one of our improved Pug Mills or at least have one of our Wrought Iron Pug Mill Shafts, with Mud Wing. The labor of the horse is considerably lessened by the use of the wrought iron shaft, and the effect and operation of the Mud Wing is to cause the clay to be forced out regularly and steadily into the moulds, thus fully supplying the moulds and filling out the corners making the very best quality of brick and at the same time greatly increasing the capacity of the machine.

ITS RECORD CANNOT BE BEAT.

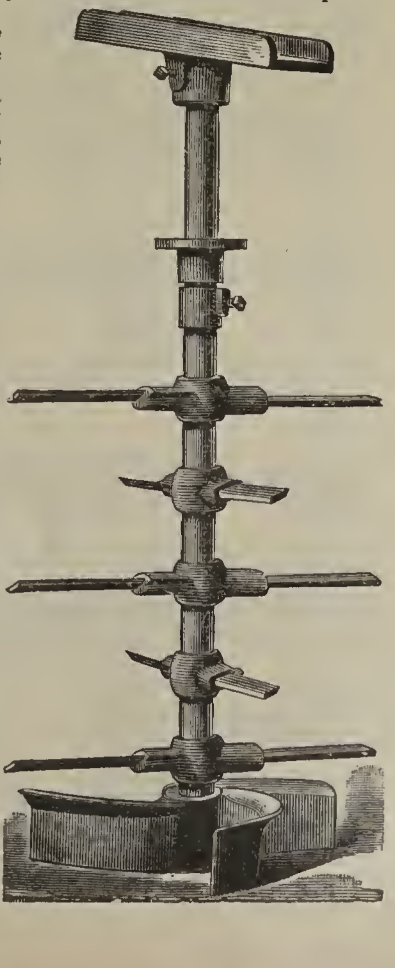
Thousands of the "Old Reliable" are in use and rendering full and complete satisfaction to brick makers in all parts of the country. An experience of twenty years gives them unqualifiedly the highest degree of merit. The practical brickmakers say of them that they are the easiest working and best hand power machine in the market and we have now to announce that we have so improved it as to render it still easier to operate and we feel that we are warranted in the belief that it is without an equal.

Figure on it and you will find that it will not pay you to make brick by hand, nor will it pay you to buy the high-priced machines with heavy investment and liability to breakage and consequent expensive repairs when you can buy the

Improved "Old Reliable" for $40.

A simple, strong, efficient machine, tried and proved by years of use and endorsed by hundreds of practical brickmakers as being THE BEST.

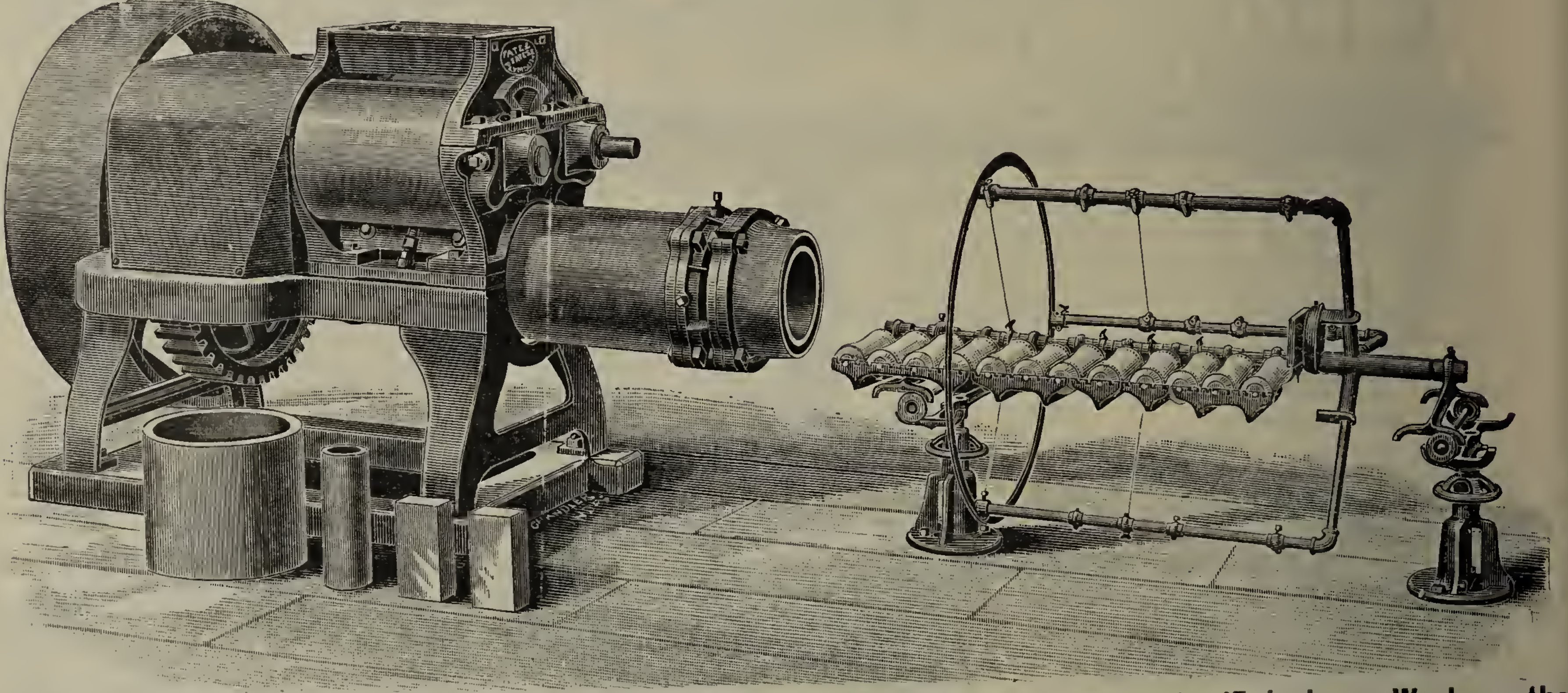
☞Send for descriptive catalogue giving prices of BRICK MACHINES, PUG MILLS, MOULDS, WHEELBARROWS, ETC.



TIFFIN ∵ AGRICULTURAL ∵ WORKS,
TIFFIN, - - OHIO.

THE OHIO BRICK AND TILE MACHINE.

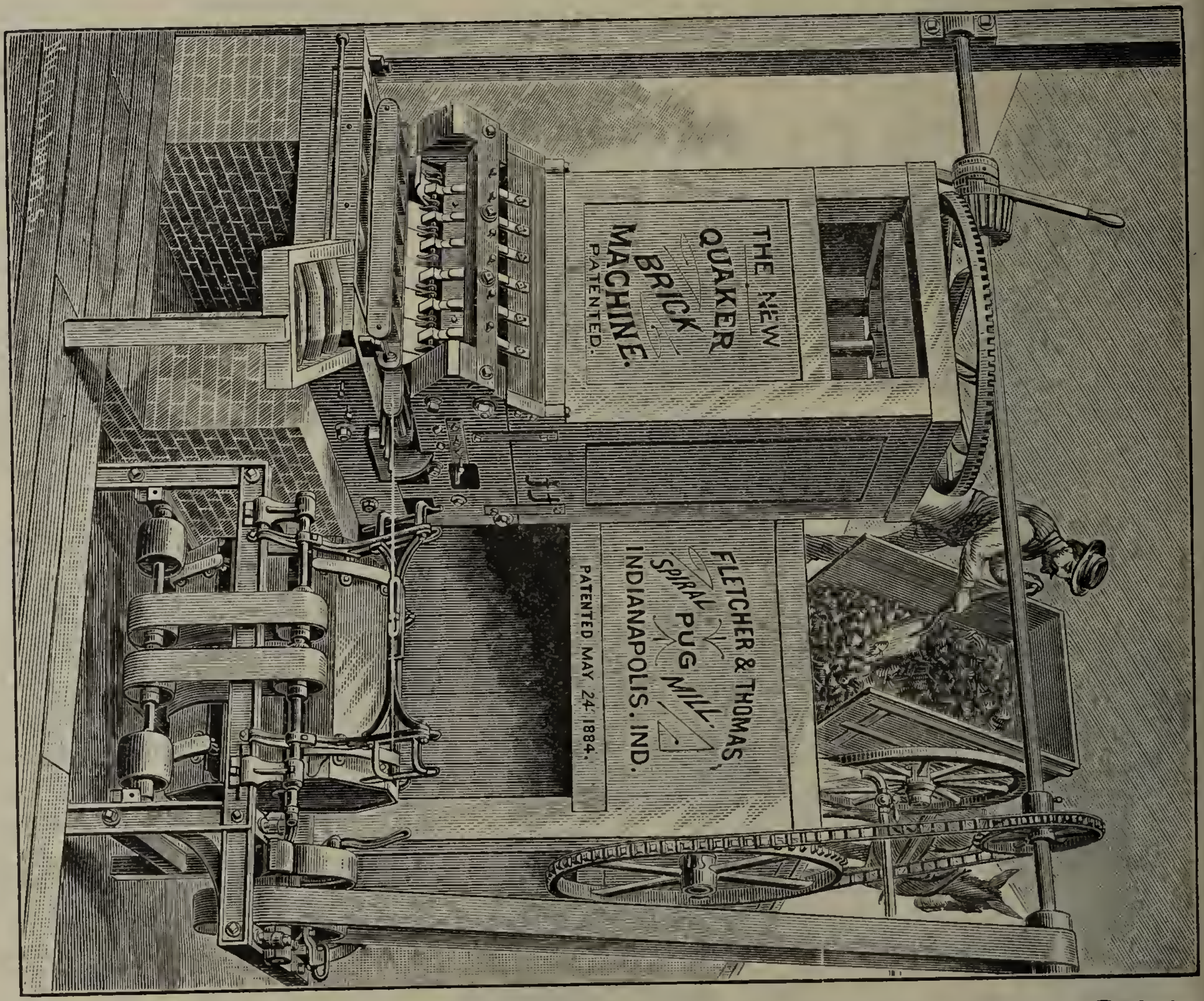
Unequalled for Rapid and Perfect Work!



Most simple, durable and convenient in use. Side or end cut brick. Tile up to 15 inches. We have the latest and most approved Cutting Tables. Satisfaction guaranteed. Factory outfits furnished. Address

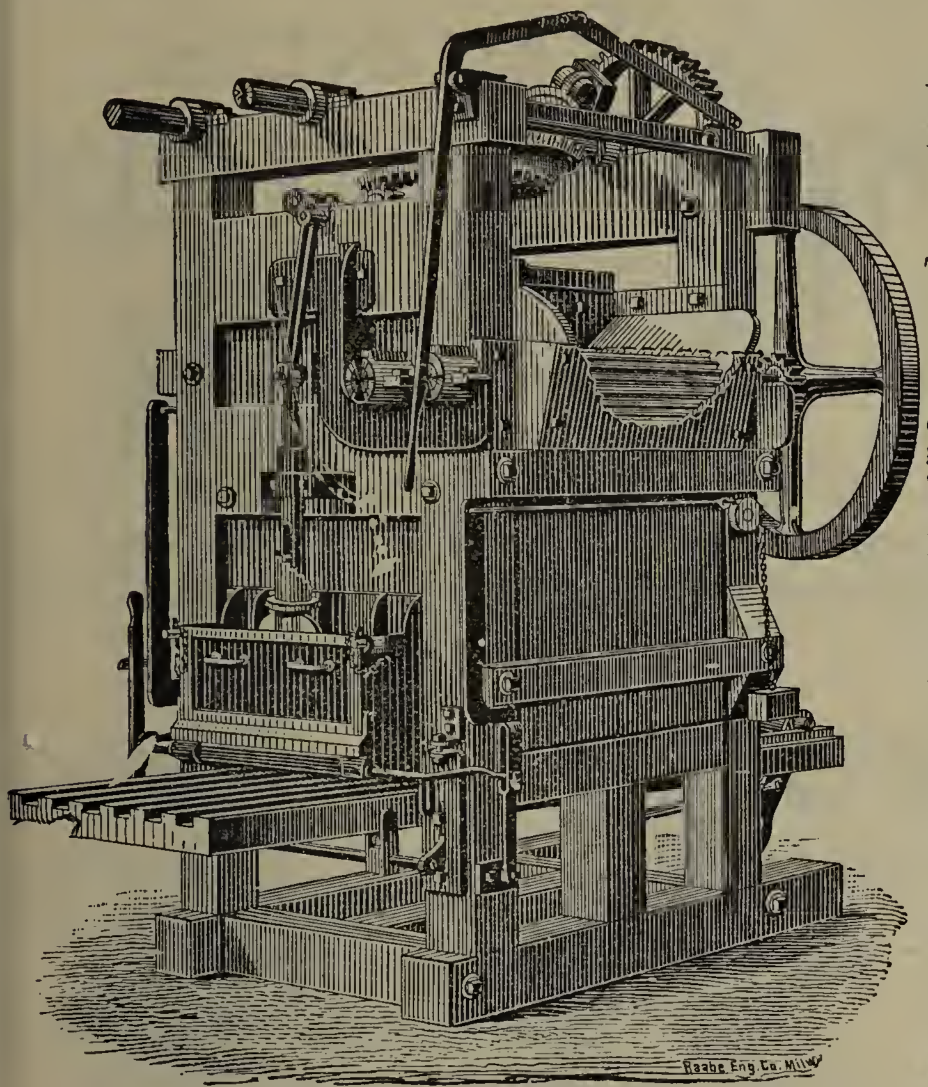
FATE & FREESE,
PLYMOUTH, OHIO.

Send for particulars.


THE NEW QUAKER BRICK MACHINE.
PATENTED.
FLETCHER & THOMAS SPIRAL PUG MILL INDIANAPOLIS, IND.
PATENTED MAY 24. 1884.

This outfit will make the largest number of the very best of Pallet Bricks at Least Cost of anything in the market. For further particulars, address

BENNETT BROS. & CO., Wellington, Lorain Co., Ohio.



GURNEY

BRICK MACHINE WORKS,

MILWAUKEE, WISCONSIN,

Manufacturers of

THE GURNEY BRICK MACHINE

—Having Crushers Inside of Pug Mill.—

THIS is the only Machine in use which has the *combination of Crushers, Mixing and Moulding Apparatus* in a single machine. The arrangement is covered by patent issued October 6, 1885.

This machine will work any clay, however hard and lumpy, with no preparation before soaking in the usual way. The Crushers will take the clay through as fast as the machine will turn out the brick, *doing entirely away with lumps*, which brickmakers know have been much in the way of making good brick, and also have caused great loss by breakage.

The Machine will turn out four thousand, or more, good, smooth, square brick an hour. With proper moulding sand THE BRICK FROM THIS MACHINE, *made from any clay*, WILL SLIP EASILY. The Machine has been thoroughly tried in different parts of the country.

Also First-Class STEAM and HORSE-POWER MACHINES of same pattern, without Crushers.

For further information and Illustrated Catalogue address—

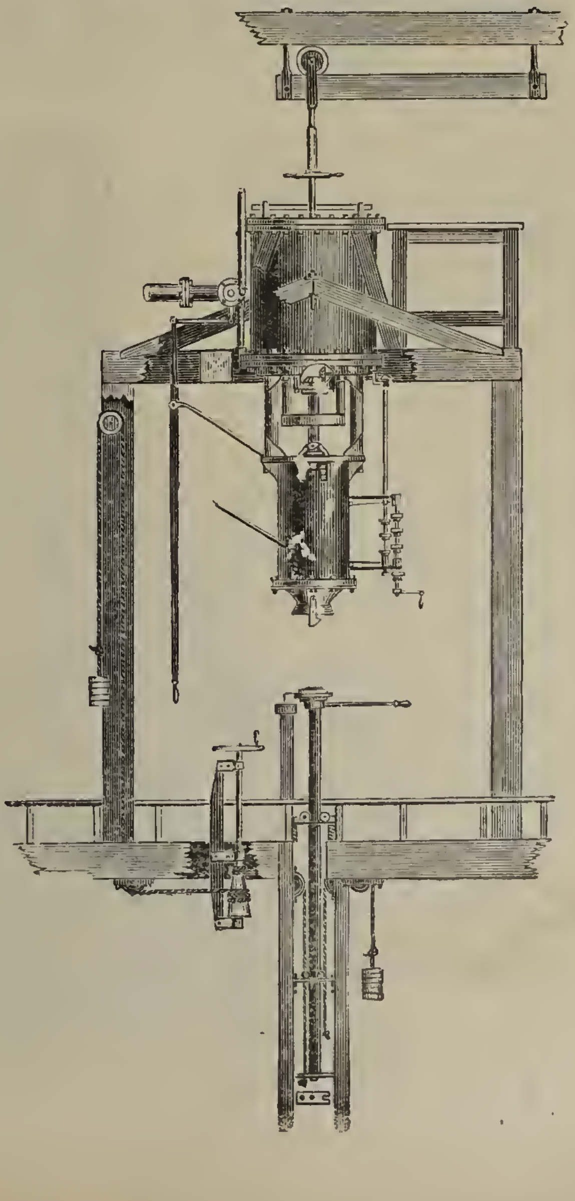
T. C. GURNEY,

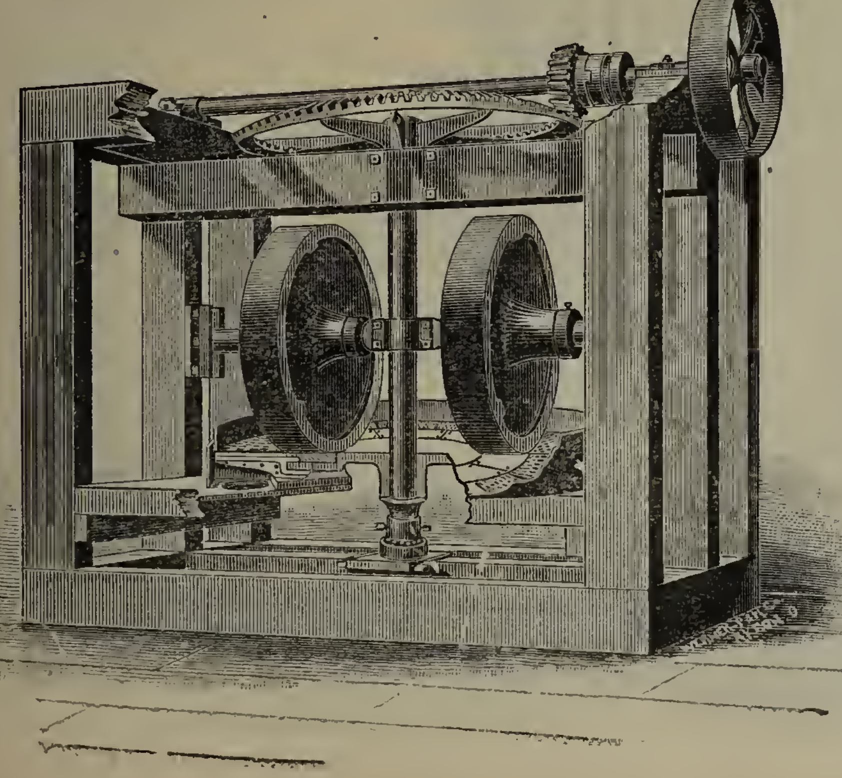
100 Wisconsin St., MILWAUKEE, WIS.

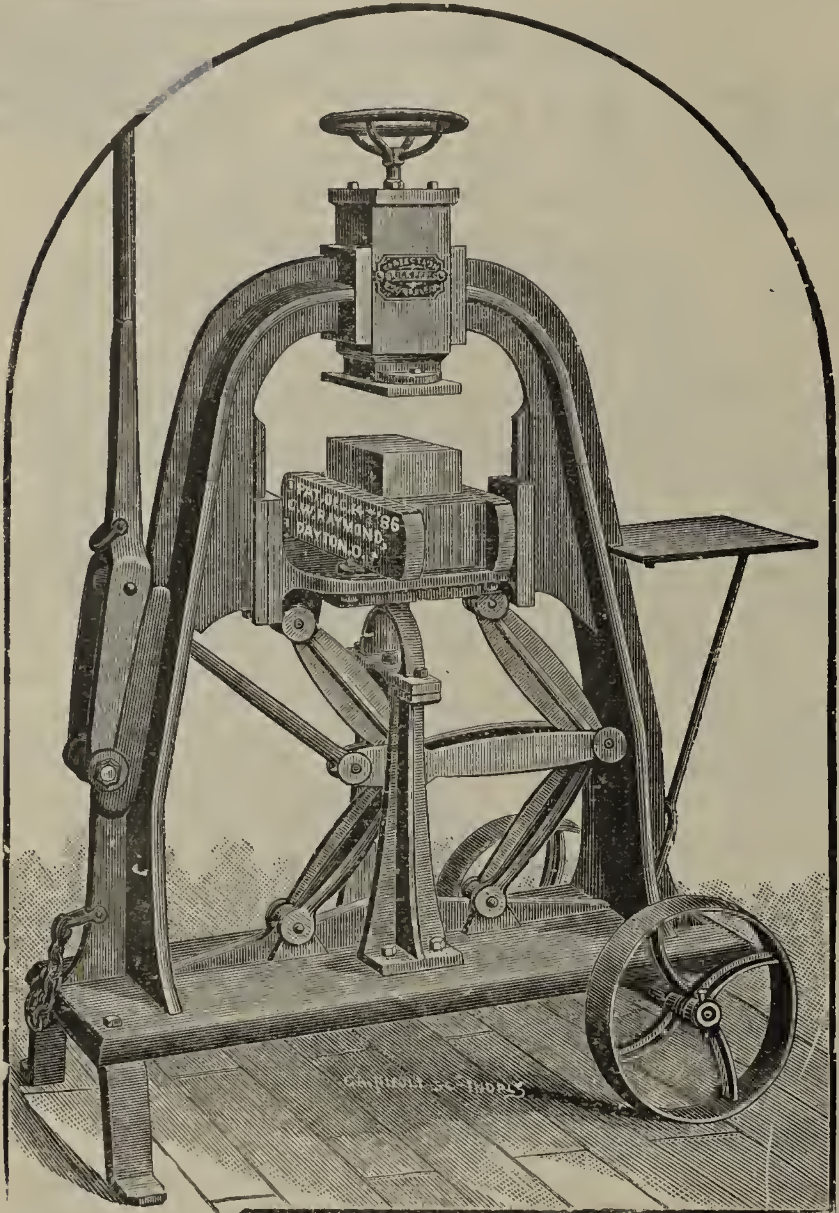
TAPLIN, RICE & CO.,

AKRON, O.

Manufacturers of Improved Clay Working Machinery of all kinds, such as Clay Mills, Dry and Wet Pans, the Barber Steam Sewer Pipe Press, Dies, Clay Blockers, Potters' Wheels and machinery of every description. Write for circulars.







RAYMOND'S

PERFECTION BRICK PRESS.

(No. 1 for Red Brick. No. 2 for Fire Brick.)

SIMPLE AND POWERFUL.

Its whole action is derived from a short, easy, but powerful movement of one lever. A PERFECT Press which turns out perfect work.

—MANUFACTURERS OF—

RAYMOND'S

Wrought Iron Tempering Wheel,

OFF-BEARING TRUCKS, BRICK AND SPRING BARROWS, MOULDS, KILN DOORS, ETC.

Send for Illustrated Catalogue.

ADDRESS

C. W. RAYMOND & CO.,

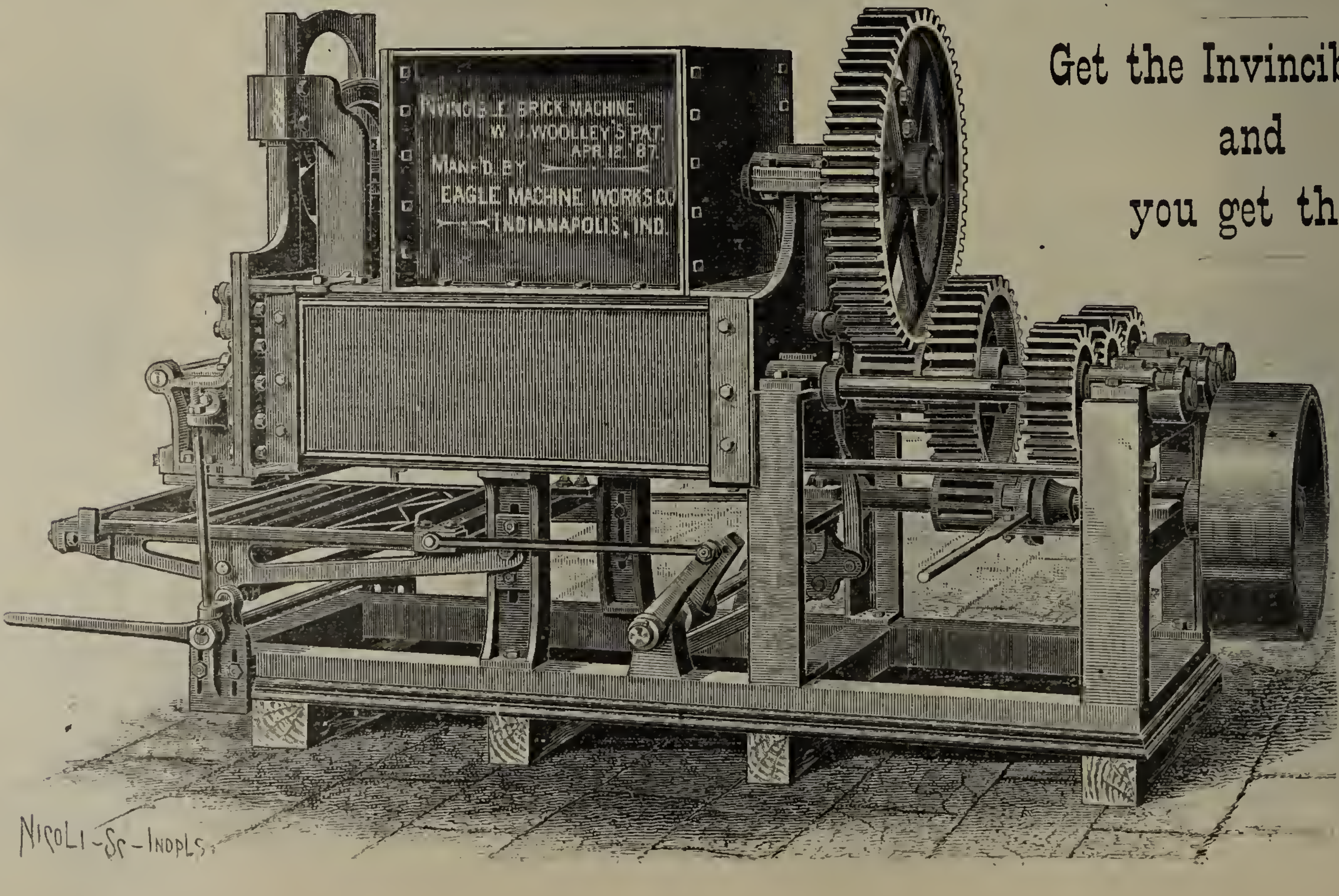
[Mention the Clay-Worker.] **DAYTON, OHIO.**

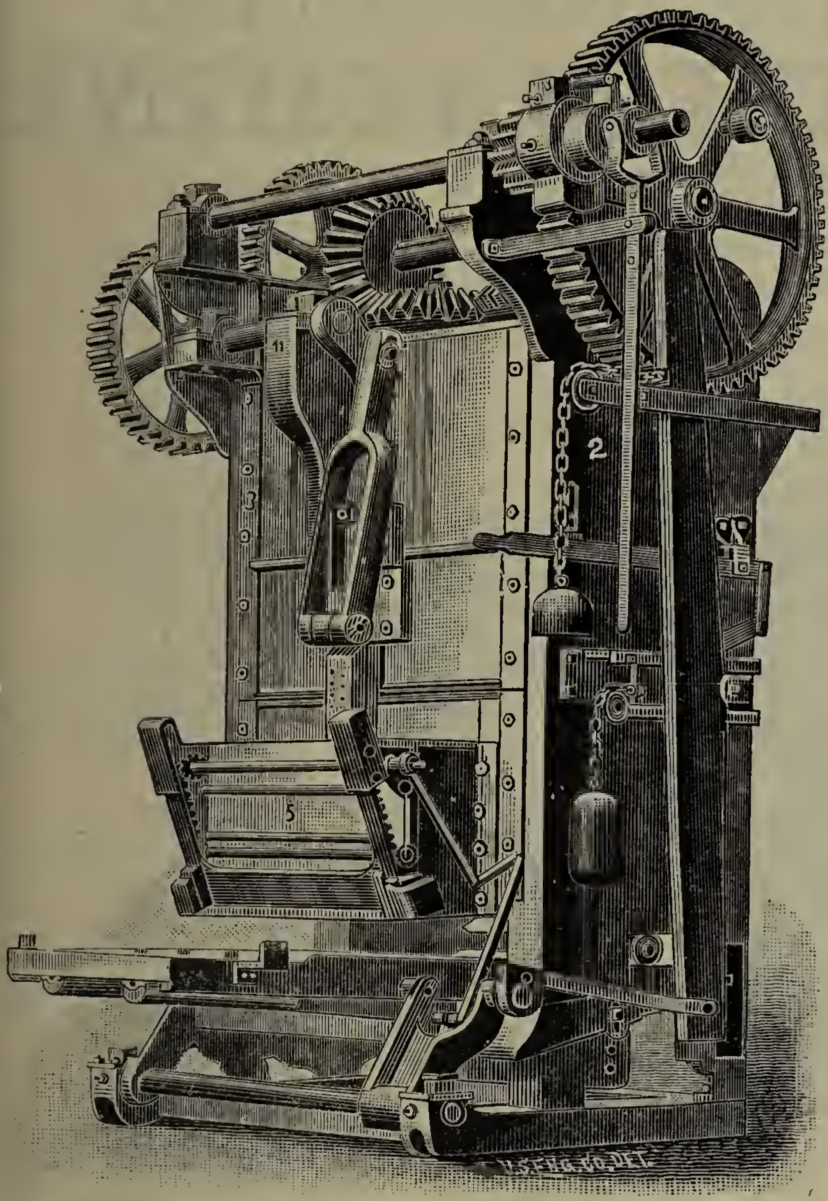
The Invincible Brick Machine.

The STRONGEST, MOST DURABLE and BEST BRICK MACHINE in the market. Write for full description, prices, etc., to

EAGLE MACHINE WORKS CO., Indianapolis, Ind.

Get the Invincible
and
you get the best.


INVINCIBLE BRICK MACHINE.
W. J. WOOLLEY'S PAT.
APR. 12. '87.
MAN'F'D BY
EAGLE MACHINE WORKS CO.
INDIANAPOLIS, IND.
NICOLI-Sc-INDPLS.



THE DUPLEX BRICK MACHINE.

It is made entirely of iron and steel, strong and durable, has a large square tub, with two grinding shafts revolving in opposite directions which gives it a pugging capacity superior to any other machine in the market. It has a powerful press adjustable drop-table, a very sensive mould-pushing device and safety friction clutch.

Twenty-two Duplex Machines and Elevators have been set up here in Detroit and vicinity alone the last two seasons, with third and fourth orders on hand for more. For catalogue and prices, address

F. HUETTEMAN & CO.

12 to 16 Sherman Street,

Detroit, Mich.

☞ *Plans for New Yards and entire Outfits furnished and contracted for.*

THE STANDARD BRICK MACHINES

—MANUFACTURED BY—

A. M. & W. H. WILES,

Grassy Point, Rockland County, New York.

These Moulding Machines have been in constant use for over thirty years, and are the original of all machines now made that use a Pug Mill and Square Press, and they are the best and most economical machine now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brick making since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest work in use.

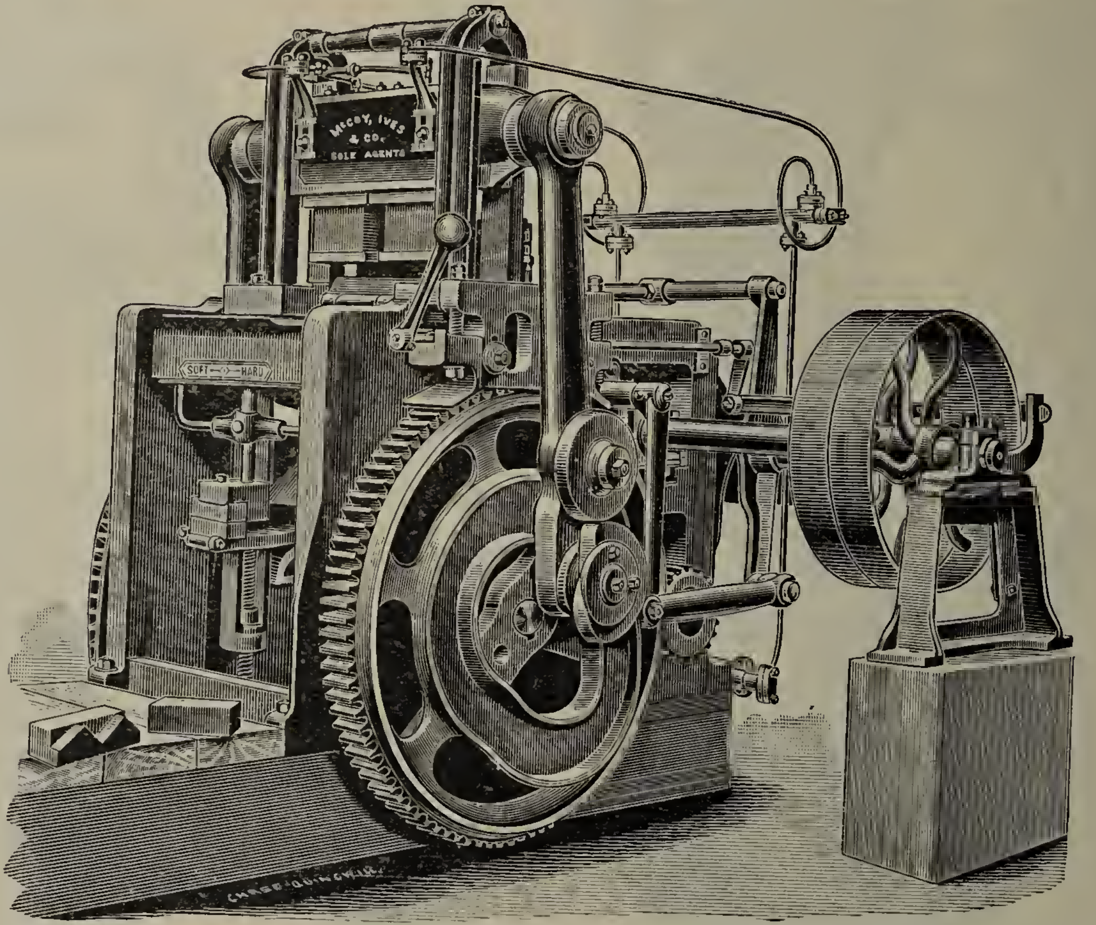
We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

Mention the Clay Worker. CORRESPONDENCE SOLICITED.

WHITTAKER'S CELEBRATED
SEMI-DRY BRICK MACHINE

[Patented in U. S. May 13, 1884.]

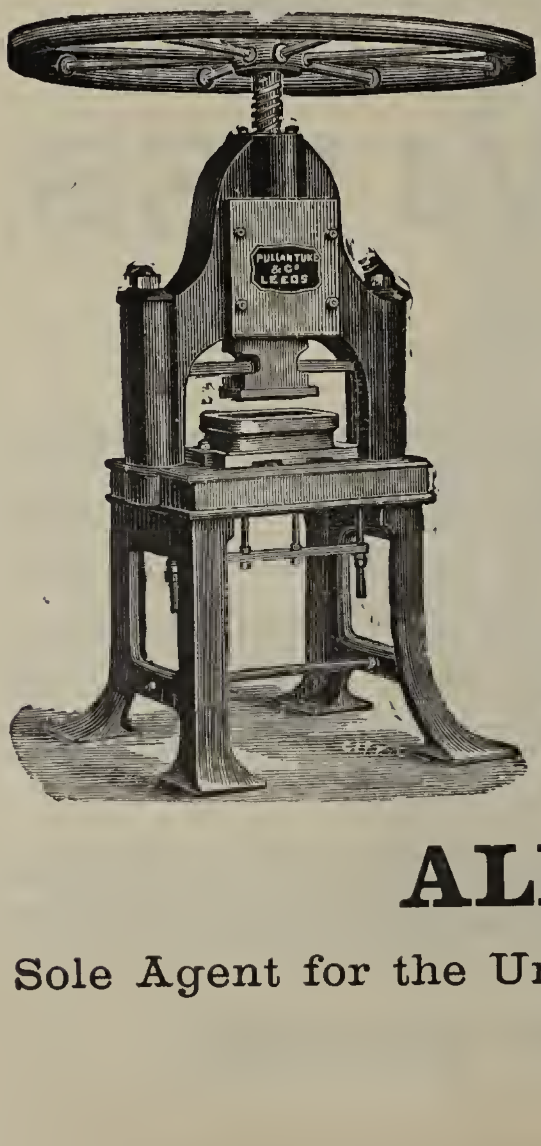
THE BEST ON EARTH.


McCOY, IVES & CO. SOLE AGENTS

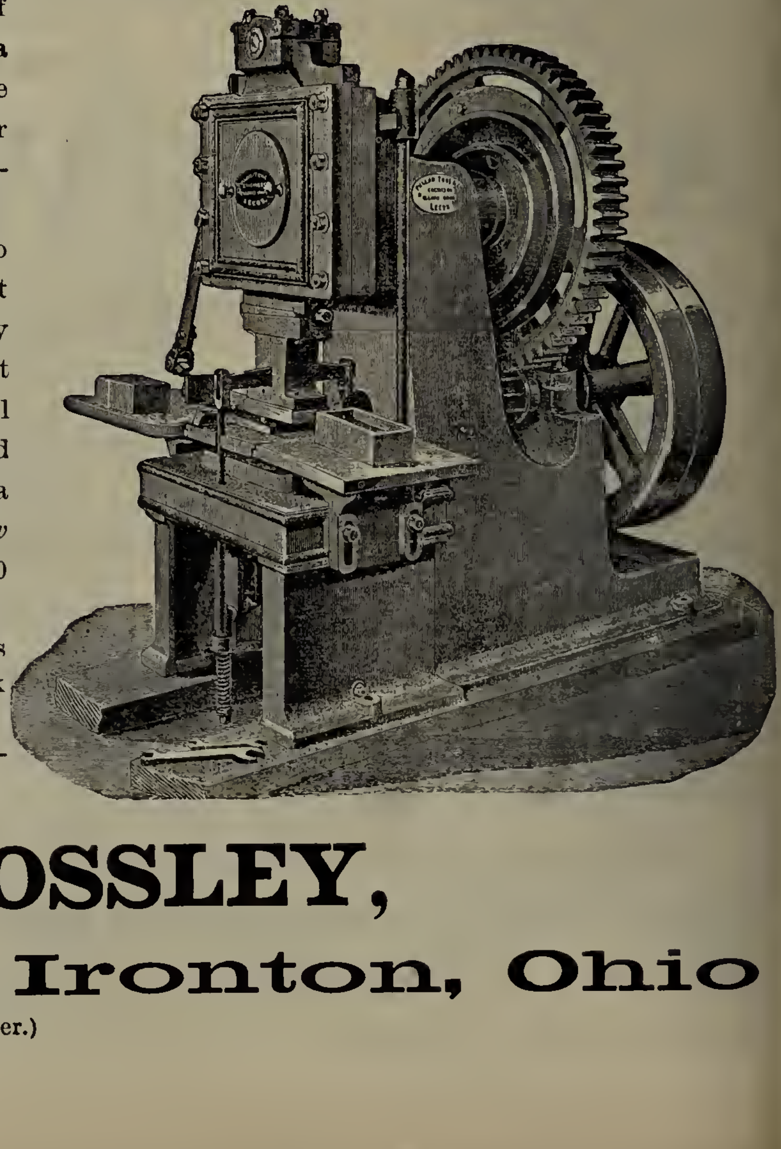
THE BEST ON EARTH.

For Circulars and other information address **McCOY, IVES & CO., Quincy, Ills.**

Titley's Patent Screw Press.



Pullan, Tuke & Gill's Patent Steam Press



WE beg to call the attention of Brick, Tile and Terra Cotta Makers to these two Presses as the *Peers of any press on the market* for superiority of finish in the work produced.

The *Steam Press* is best adapted to large works and will produce the best quality of Front Bricks. Its capacity is 10,000 per day of the finest bricks at the smallest cost for labor. For small works and for all makers of moulded and ornamental bricks, tiles and terra cotta, we recommend the *Screw Press*. It will exert a pressure of 30 tons and is to-day *without a rival* a the *best press on the market.* Its capacity is 3,000 to 4,000 plain brick per day.

Send for circulars giving all information, with testimonials.

ALFRED CROSSLEY,

Sole Agent for the United States. **Ironton, Ohio**

(Mention the Clay-Worker.)

H. Brewer & Co's. Clay Crusher and Stone Separator.

The prominent feature in this Crusher is the combination of two smooth, tapering crushing rolls, running at different speeds, in connection with an adjustable transverse roll which is of irregular form and provided with teeth or spurs, whereby the clay is rapidly broken up and crushed, and the stones separated therefrom.

TESTIMONIALS.

Saunemin, Ills., May 18th, 1888.

H. Brewer & Co., Gentlemen—Your Crusher works to a charm and we are very highly pleased with it. It runs one-half easier than any other Crusher we have had.

Yours Truly,
SAUNEMIN BRICK AND TILE CO.

Budd, Ills., May 3d, 1888.

H. Brewer & Co., Dear Sirs—The Crusher and Elevator work to my entire satisfaction. I feel confident I would be $2,000 ahead, to-day, had I put in your Machine and Crusher at the start.

Yours Truly,
HENRY SIEDENTOP.

Monroe, Iowa, May 15th, 1888.

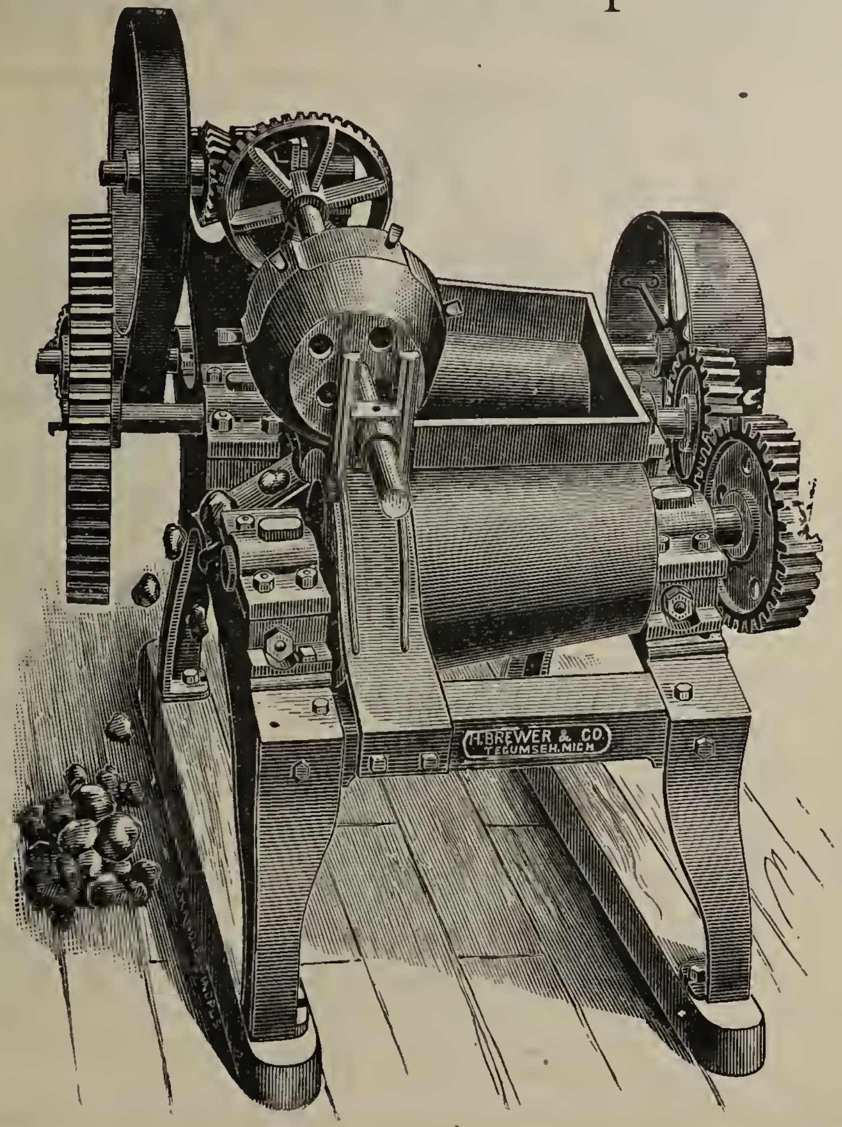
H. Brewer & Co., Gentlemen—The Crusher is giving good satisfaction and I think will do all that is claimed for it.

Yours,
T. P. BURCHINAL.

☞Do not fail to obtain our prices on Tile Machines, Brick Machines, Pug Mills, Clay Crushers, etc. For illustrated Catalogues and Price List, address

H. BREWER & CO.,
Teeumsch, Mich.

(Mention Clay-Worker.)



STEDMAN'S IMPROVED

Disintegrator and Pulverizer.

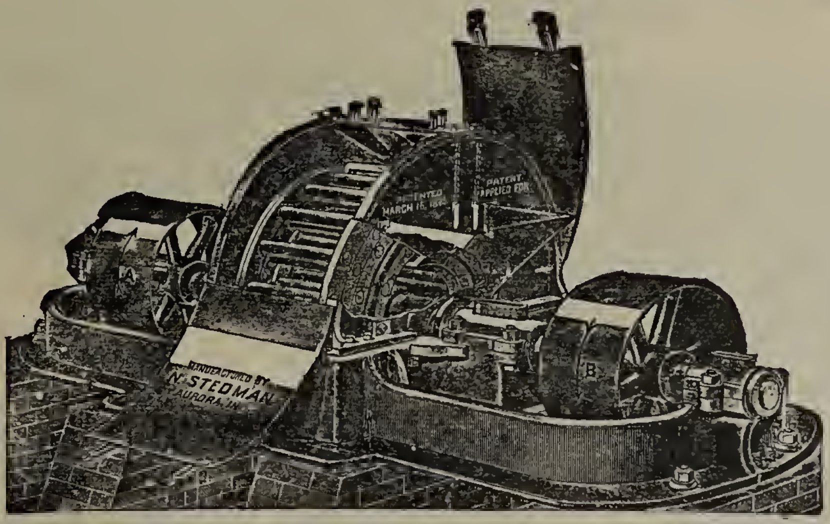
This mill will disintegrate or pulverize the following materials:

Clays of all kinds, Shale and Slate direct from the bank, for Brick and Tile.

Fire Clay and Sand Stone Rock—for Cement and Fire Brick.

Iron Ores of various kinds, Guano, Phosphates, Bones—green, dry steamed, Tankage, Bone-Ash, Salt Cake, Soda, Cracklings, Oyster Shells, Animal Matter in almost all conditions, Old Fire Brick and Tiles.

Old Pottery Ware, Plastic Clay, Asbestos, and in fact almost any material that can be disintegrated.



A good Disintegrator and Pulverizer is a long felt want in many branches of business. This Mill is an improvement over any yet made and is the result of practical experience.

This Mill is made in three sizes: 34, 40 and 48 inches. The capacity for clay is as follows:

34 inch Mill will pulverize for from 15,000 to 25,000 brick per day.

40 inch Mill will pulverize for from 20,000 to 35,000 brick per day.

48 inch Mill will pulverize for from 75,000 to 100,000 brick per day.

To Brick, Tile and Pottery Men and to Terra Cotta Works this Mill is invaluable. It reduces the clay to a fine, light and soft condition, with its full adhesive properties retained.

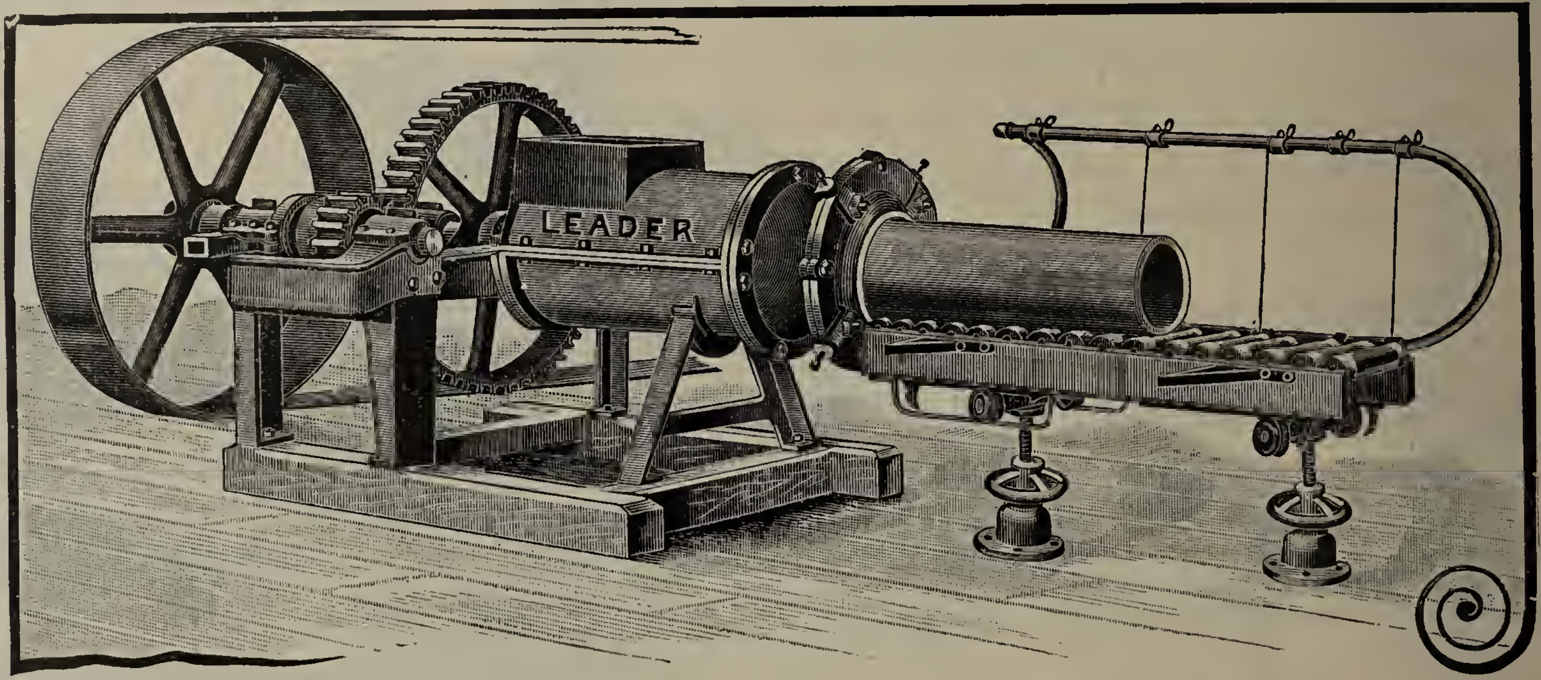
For Prices and any other Information, Address

Stedman's Foundry and Machine Works,

PROTECTED BY PATENTS.
[Mention the Clay-Worker.]

AURORA, IND.

THE LEADER BRICK AND TILE MACHINE.



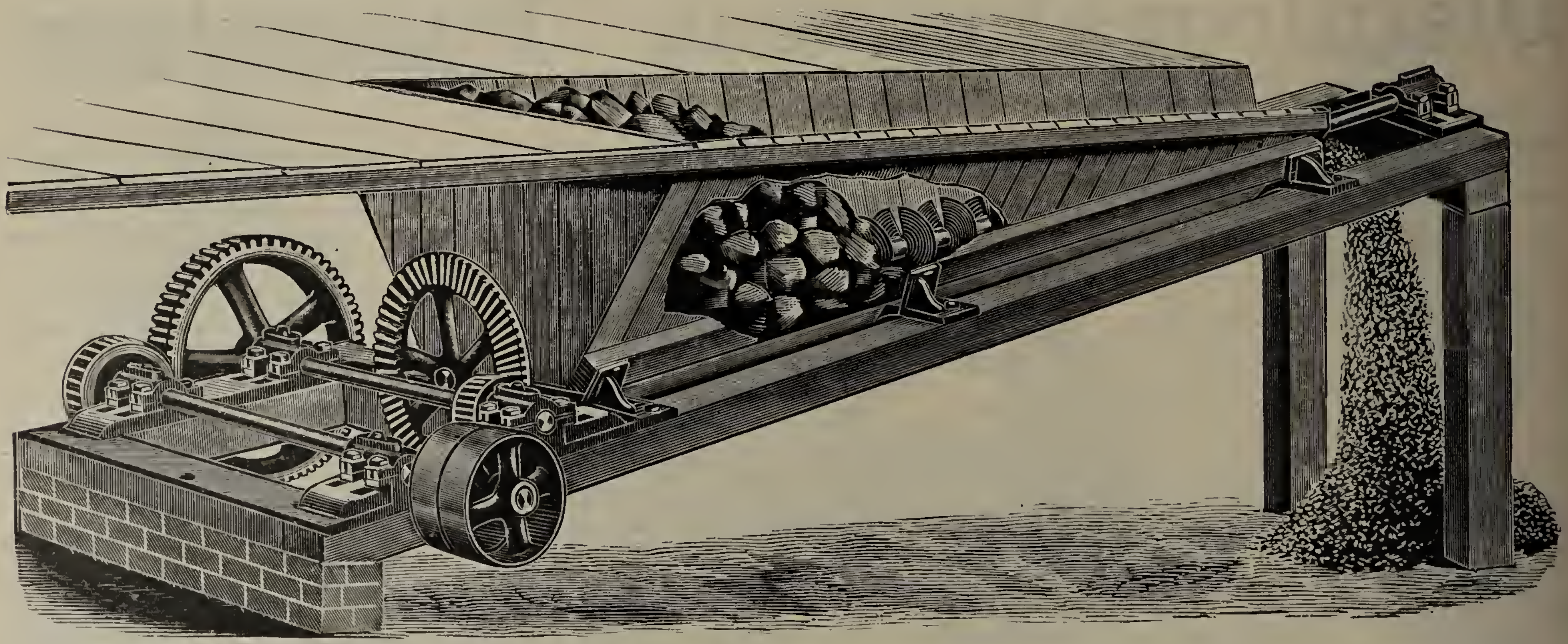
We manufacture the very latest and best designs of Tile Machines, Brick Machines, Clay Crushers, Elevators, and Dump Cars for handling clay by steam. Design special clay-working machinery to order. Have a large stock of the best cutting wire. Correspondence solicited.

BROWN & HARROP MFG. CO.,

Geo. S. Pollock, Agent, Sullivan, Ind PORTLAND, IND.

Emen's Patent Perfection Clay Granulator and Feeder.

SOLD SUBJECT TO TRIAL AND APPROVAL.



Saves time and labor and produces better ware; simple in construction; rapid and accurate in operation Every brick, tile and sewer pipe manufacturer should investigate the merits of this machine.

During the past season it was introduced in several of the leading Chicago brickyards and is now at work giving entire satisfaction. Write for descriptive circulars.

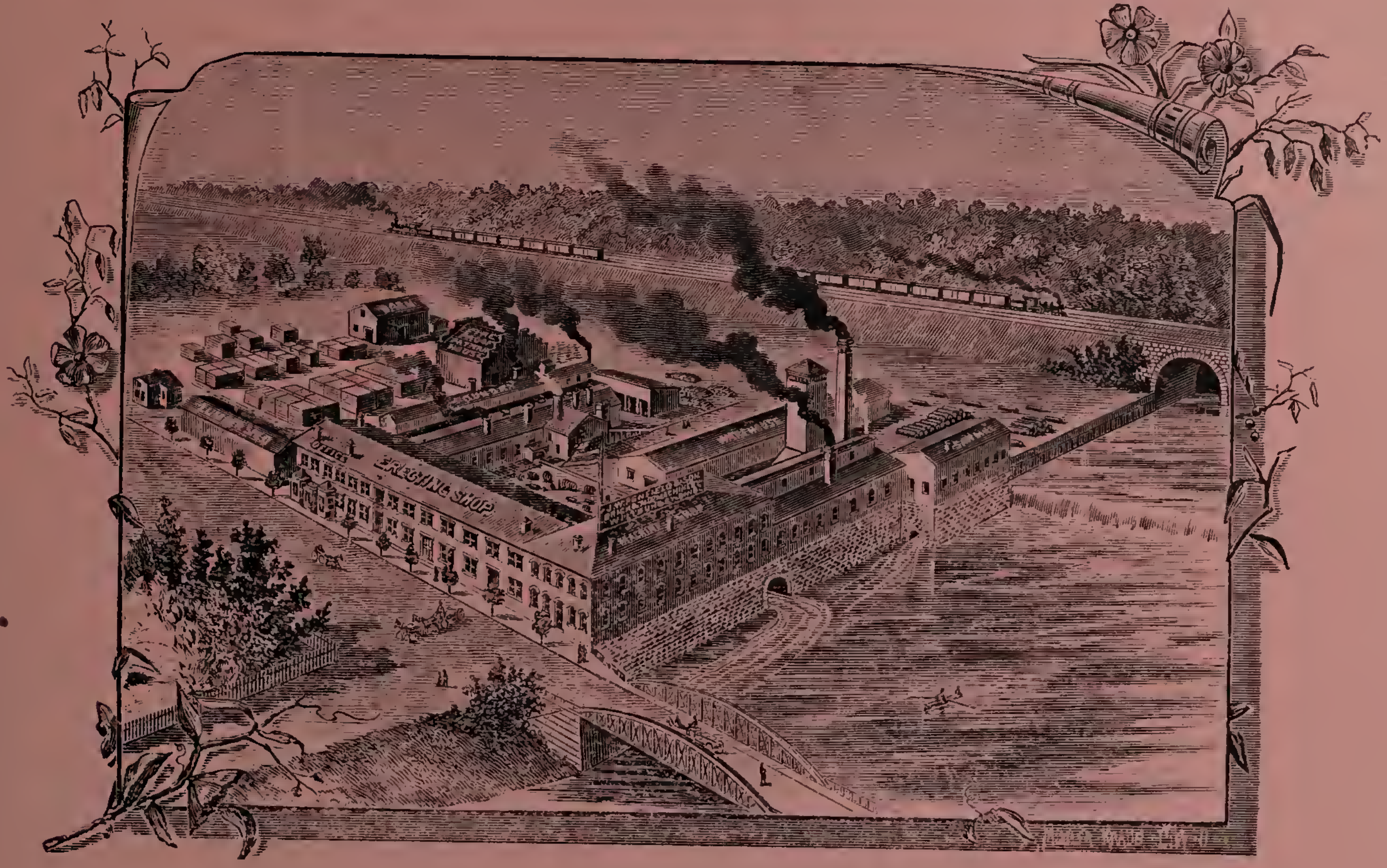
Chambers Brothers Company, of Philadelphia, Pa., are licensed to manufacture and sell these machines.

EMENS AND COLE

[Mention Clay-Worker.] HOLTON, (MUSKEGON CO.) MICH.

J. W. PENFIELD & SON,

WILLOUGHBY, OHIO, U. S. A.



CUT OF WORKS.

MANUFACTURERS OF

CLAY WORKING MACHINERY

INCLUDING

Stiff Clay Brick Machines, Soft Mud Brick Machines,
Tile Machines, Steam and h.p., Clay Crushers and Stone
Separators, Stiff Clay Pug Mills, Soft Mud Pug Mills,
Granulators, Elevators and Conveyors, Kiln Castings and Yard Supplies,
Iron Dry Cars, Turn Tables, Cast Pulleys, Line Shafting
and Hangers, Couplings, Set Collars, Etc.

WE HANDLE ENGINES AND BOILERS.

All parties intending to purchase soft mud machinery should write for photo and description of our New Stock Brick Machine.

Our Patented Steam Dryer is the Best.

COME AND SEE US.

IF YOU WANT ANYTHING IN OUR LINE FROM A COMPLETE OUTFIT TO A WHEEL BARROW, OR FROM A GRATE-BAR TO A STEAM DRYER, DON'T FAIL TO WRITE US FOR FIGURES.

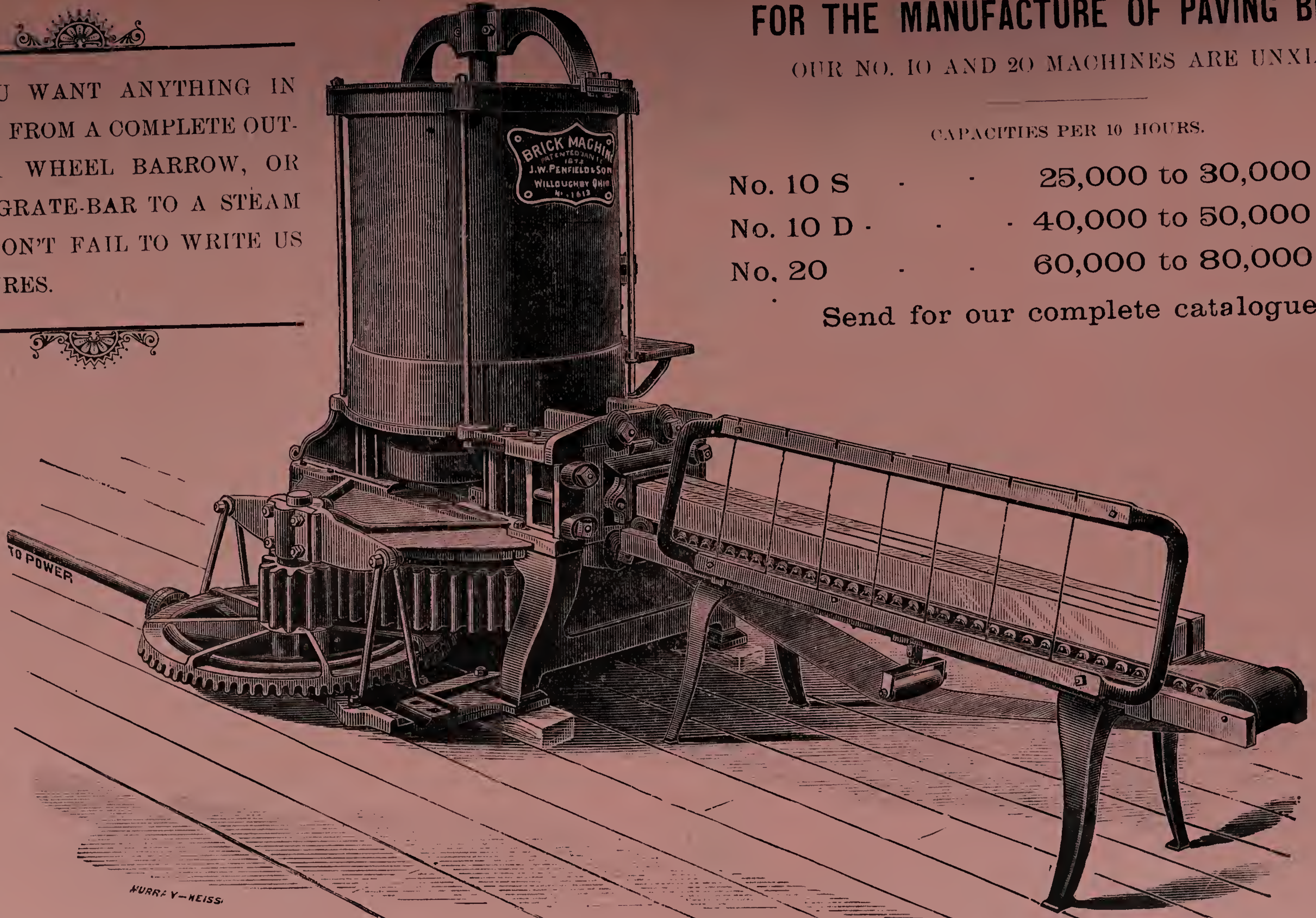
FOR THE MANUFACTURE OF PAVING BRICK,

OUR NO. 10 AND 20 MACHINES ARE UNXLD.

CAPACITIES PER 10 HOURS.

No. 10 S . .	25,000 to 30,000 Brick.
No. 10 D . . .	40,000 to 50,000 Brick.
No. 20 . .	60,000 to 80,000 Brick.

Send for our complete catalogue.



NO. 10 S BBICK MACHINE.

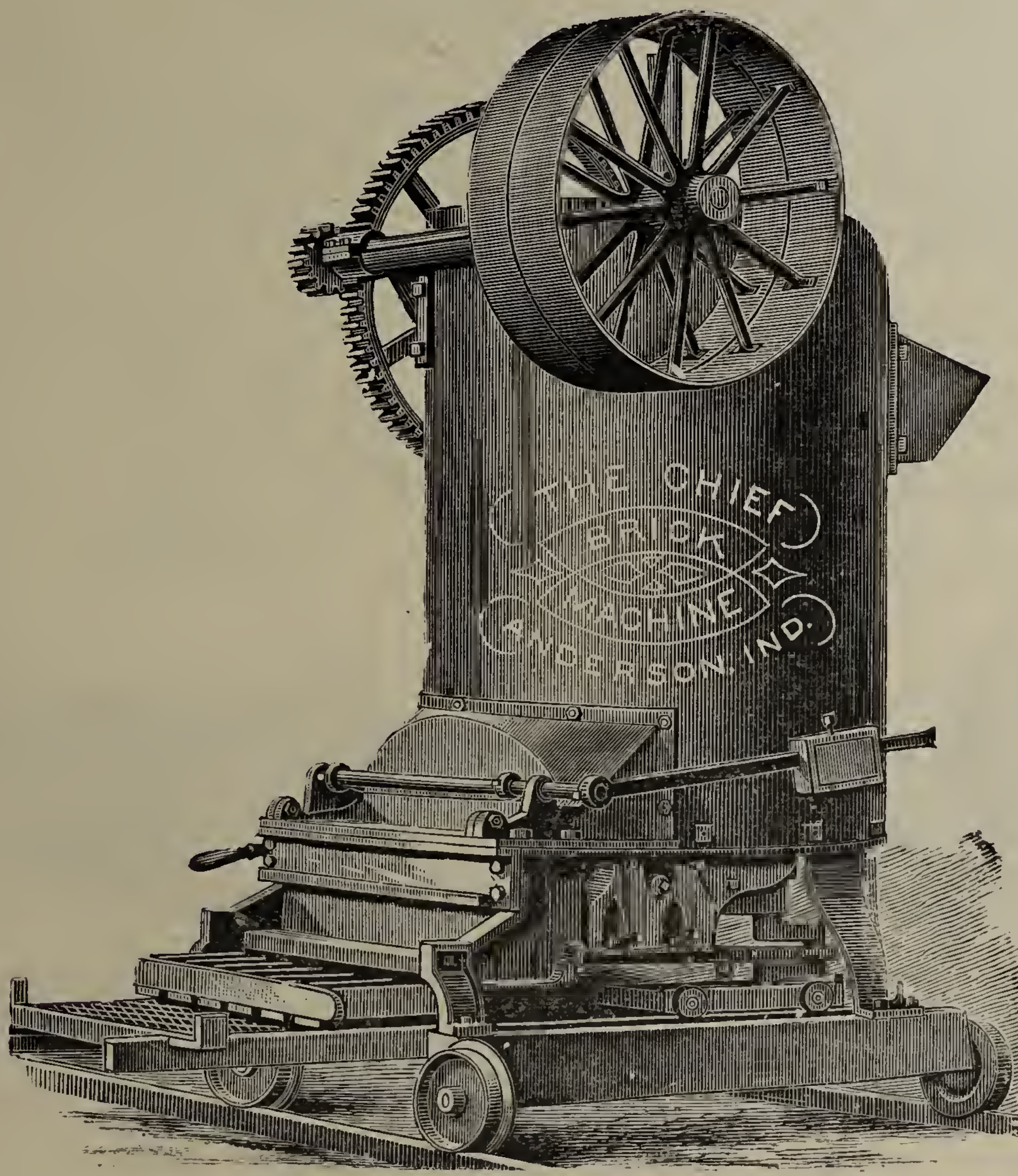
Address the manufacturers,

J. W. PENFIELD & SON,

WILLOUGHBY, OHIO, U. S. A.

Read the other side.

THE NEW IMPROVED
CHIEF BRICK MACHINE.



Patented Jan. 1, 1884, *April* 2, 1884, *and the new improvements of* 1887 *and* 1889.

Has taken the lead and stands at the head of all Brick Machines, and is now in operation in every State and Territory in the Union.

In its original construction it was exhibited and operated at the great Southern Exposition at Louisville, Ky.; also at St. Louis, Mo., Kansas City, Mo.; Indianapolis, Ind.; Columbus, O.; Cincinnati, O.; Chicago, Ill.; and at each and all places where premiums were awarded the CHIEF carried off the first prize medal over all competitors.

And with the late new improvements added the CHIEF stands in perfection, at the head of human inventions.

The NEW IMPROVED CHIEF is wonderful in operation, is all steel and iron, and of the greatest strength and durability, is easily operated, and with two horses or a small engine makes 60 to 100 perfect bricks per minute. Grinds, tempers and at the same time moulds into brick any clay. Stones in clay cannot break it, nor interfere with its free operation. It is easily transported, and changed from horse to steam power. It fills the moulds evenly and well until the machine is empty of clay, pressing each brick equally and solid, so all will shrink alike. The pressure can quickly be changed while the machine is running to suit the consistency of the clay. All shafts are of steel; main shaft runs in three boxes or bearings all outside of the machine into which mud or sand cannot penetrate. The wear can at all times be taken up so as to prevent leakage. The clay in the press box is under full control of the plunger, which is direct and positive, and prevents the mud from floating back into the mud drum; this feature is not found in any other mud machine.

Bricks made by the NEW IMPROVED CHIEF, are solid and perfect, and have sharp edges and corners, and do not crumble in burning.

The NEW IMPROVED CHIEF is equally suitable either for small or large yards, the best of bricks are made by it at the least labor and expense, all parts are easy of access and the bearings can be oiled from the outside. All ordinary sizes of brick as well as ornamental brick can be made on the NEW IMPROVED CHIEF and it is especially adapted to making fire brick of any shape.

The NEW IMPROVED CHIEF is sold on its merits, and warranted to be all that is claimed for it.

We will send Circulars and Testimonials of the NEW IMPROVED CHIEF BRICK MACHINE, New Departure Tile Machine, Engines, Etc., Etc., free to any address on application. Address

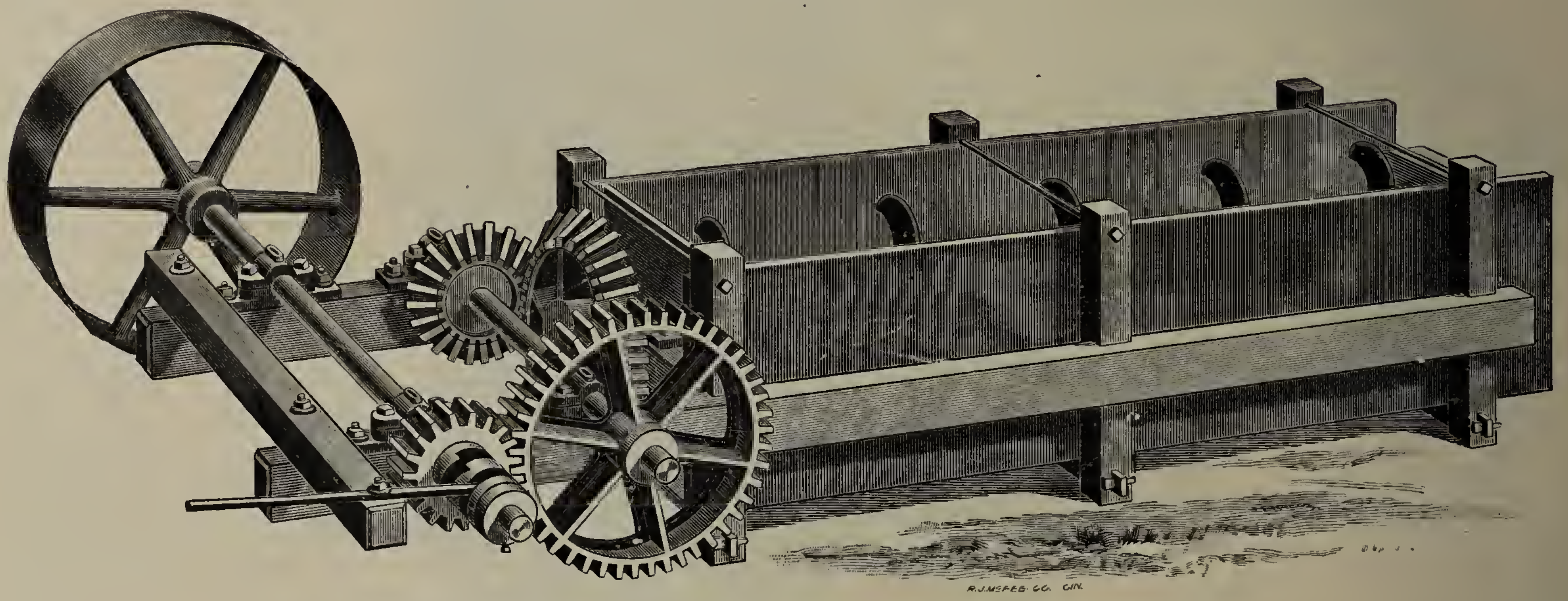
Anderson Foundry & Machine Works,

[Mention the Clay-Worker.

Anderson, Indiana.

AUTOMATIC.

Knowing that we have a good thing we will not hide it under a bushel (although a bushel of 'em would like us to.) Subject of the present discourse: "Pudding," it being claimed the proof of which is in the eating. Now among those who attempted to prove it by partaking of a goodly slice were J. P. Stillwaugh & Son, Hamilton, Ohio; Geo. H. Bruno, Brecon, Ohio; J. F. Gantz & Co., Columbus, Ohio. The "Pudding" was—no good—and these manufacturers now enjoy all the Blessings attendant on operating the "Grand Automatic," which by its exclusive merit and many points of excellence, has routed many inferior machines, among them being several all-iron—steel (and brass enough to represent themselves as good as the "Automatic.") Certain machines with a "horizontal pressure" claim they can work the mud just as stiff as it is possible to work tempered clay. Now we leave it to any Honest Manufacturer who has used the machine if they can do it. We have never seen it done. The fight is now on and we go in to win. That the "Automatic" is "Chief" not in *name* but in *deed*, we propose to establish beyond all question. A certain well known brickmaker of Illinois states that after rebuilding his "all iron and steel" machine with heavy forgings he is now making good time and a fair brick. The rebuilding cost him upward of Two Hundred Dollars. Can every brickmaker afford to do this? Is it not profitable to pay a fair price for a good thing than a low price and get "Nothing?" The attention of all Brickmakers is called to these stubborn realities and correspondence and comparison is earnestly solicited by

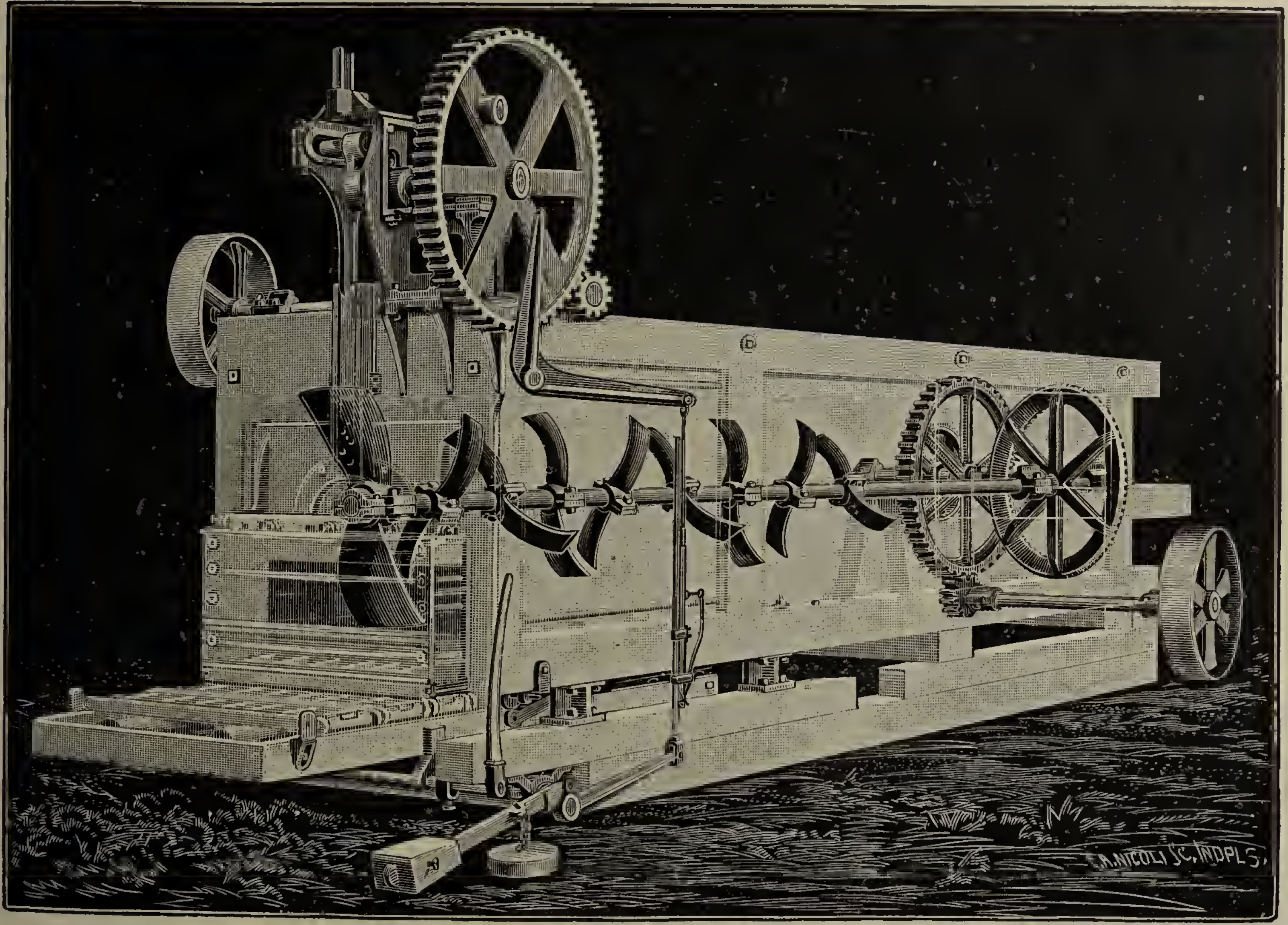

R.J.McFEE·CO. CIN.

Our Extra Heavy Pug Mill—sells for same price as inferior mills.

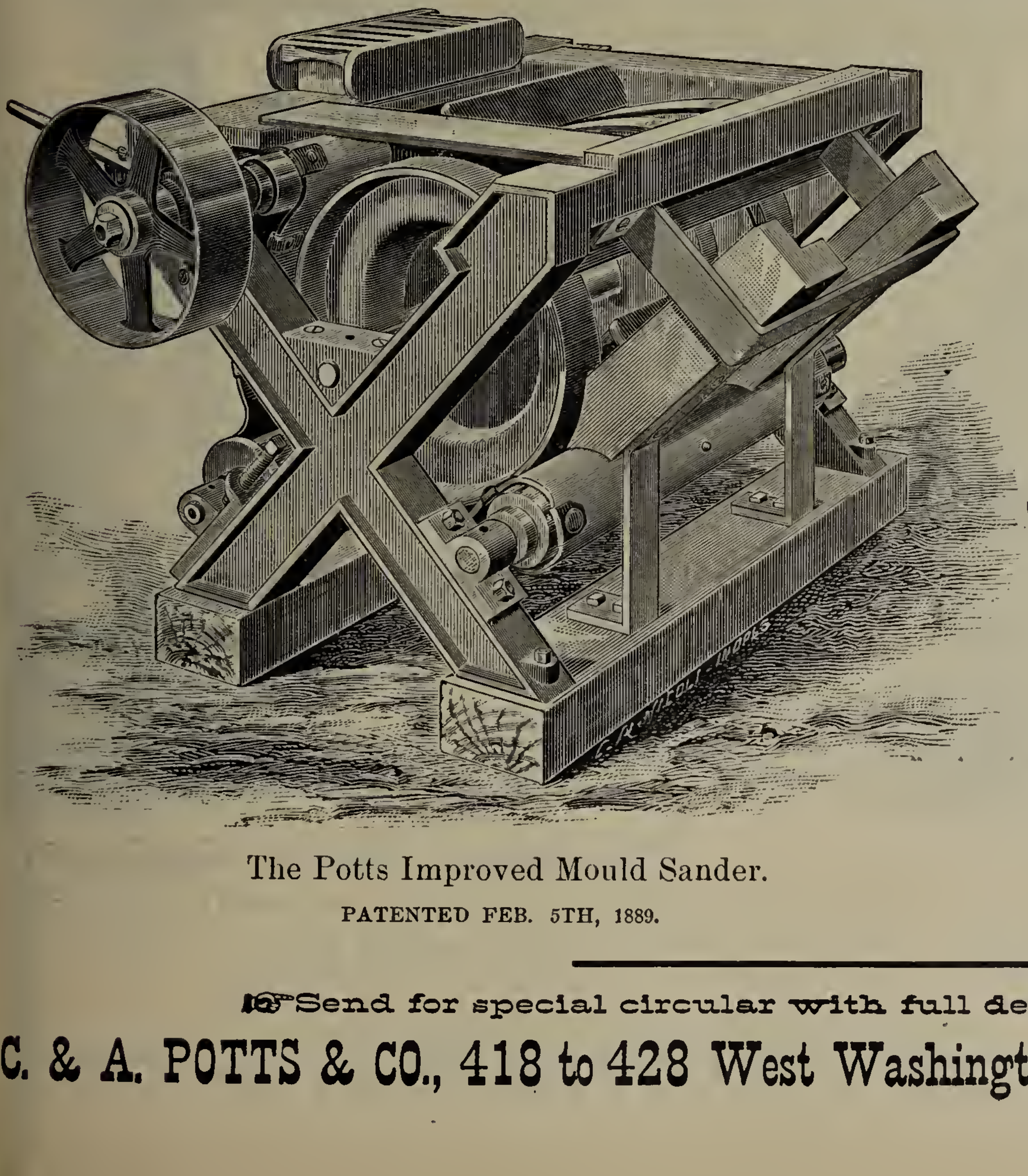
JONATHAN CREAGER'S SONS,

Arbiters of Brick Machinery. **CINCINNATI, OHIO.**

☛ LOOK AT THIS, BRICKMAKERS.


A. NICOLI SC. INDPLS.

THE POTTS STOCK BRICK MACHINE.



The Potts Improved Mould Sander.

PATENTED FEB. 5TH, 1889.

The three essentials:

SIMPLICITY,

STRENGTH,

DURABILITY,

are here combined in a perfect machine.

Don't forget that we manufacture the best of all Clay Disintegrators and a full line of clay-working machinery.

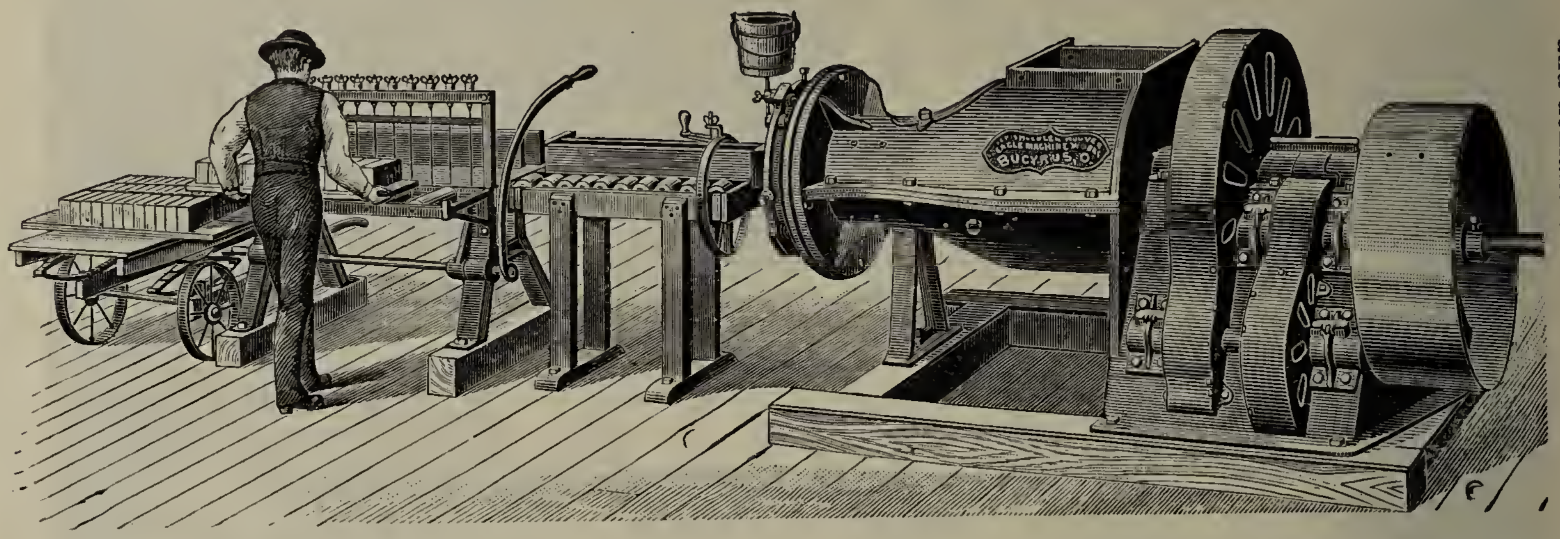
☛Send for special circular with full description and prices.

C. & A. POTTS & CO., 418 to 428 West Washington Street, INDIANAPOLIS, IND.

FREY, SHECKLER & HOOVER.

BUCYRUS, OHIO.

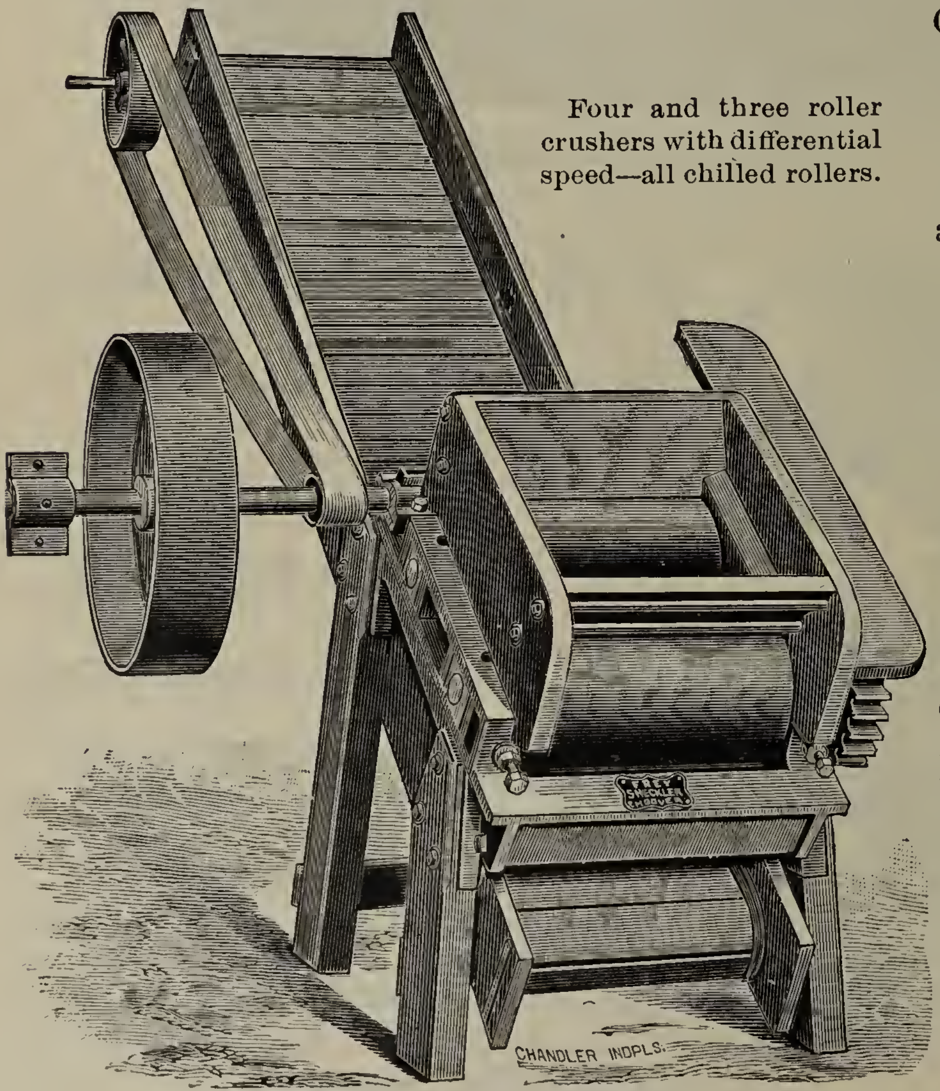
The Automatic Brick Cutting Table for one, two or three streams of brick, tile or hollow blocks, will carry off on endless belt.



The Acme Machines have steel shafts, force feed hoppers, friction clutch pulleys and the greatest varieties of cutting tables to suit all clays and demands.

The Acme Special Brick Machine with Board Delivery Cutting Table will make 40,000 brick per day with the new system and appliances. Brick can be dried on the pallets or hakes. A brick-separating and haking device is now in construction.

OUR AUTOMATIC CUTTING TABLE a great success for end-cut brick.
THE MASCOT BRICK AND TILE MACHINE for light power.
THE ACME STANDRAD MACHINE for tile (from 2½ to 20 inches), and brick.
THE CENTENNIAL BRICK AND TILE MACHINE for tile (from 2½ to 20 inches,) and brick.

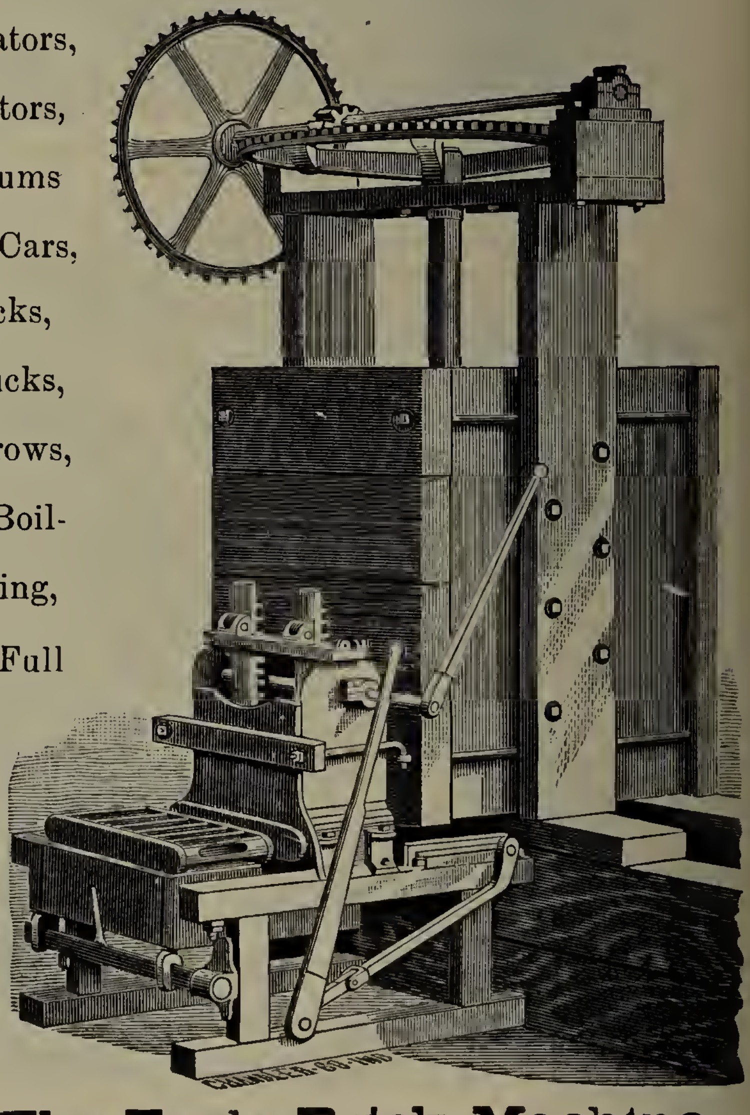

CHANDLER INDPLS.

Four and three roller crushers with differential speed—all chilled rollers.

We make thirteen different patterns of Roller Clay Crushers. All rollers best chilled iron.

PLANS FOR KILNS FURNISHED CUSTOMERS.

Clay Elevators, Tile Elevators, Steam Drums and Dump Cars, Tile Trucks, Brick Trucks, Wheelbarrows, Engines, Boilers, Shafting, Pulleys. Full outfits for Brick and Tile Factories and Fire Clay Works.



The Eagle Brick Machine.

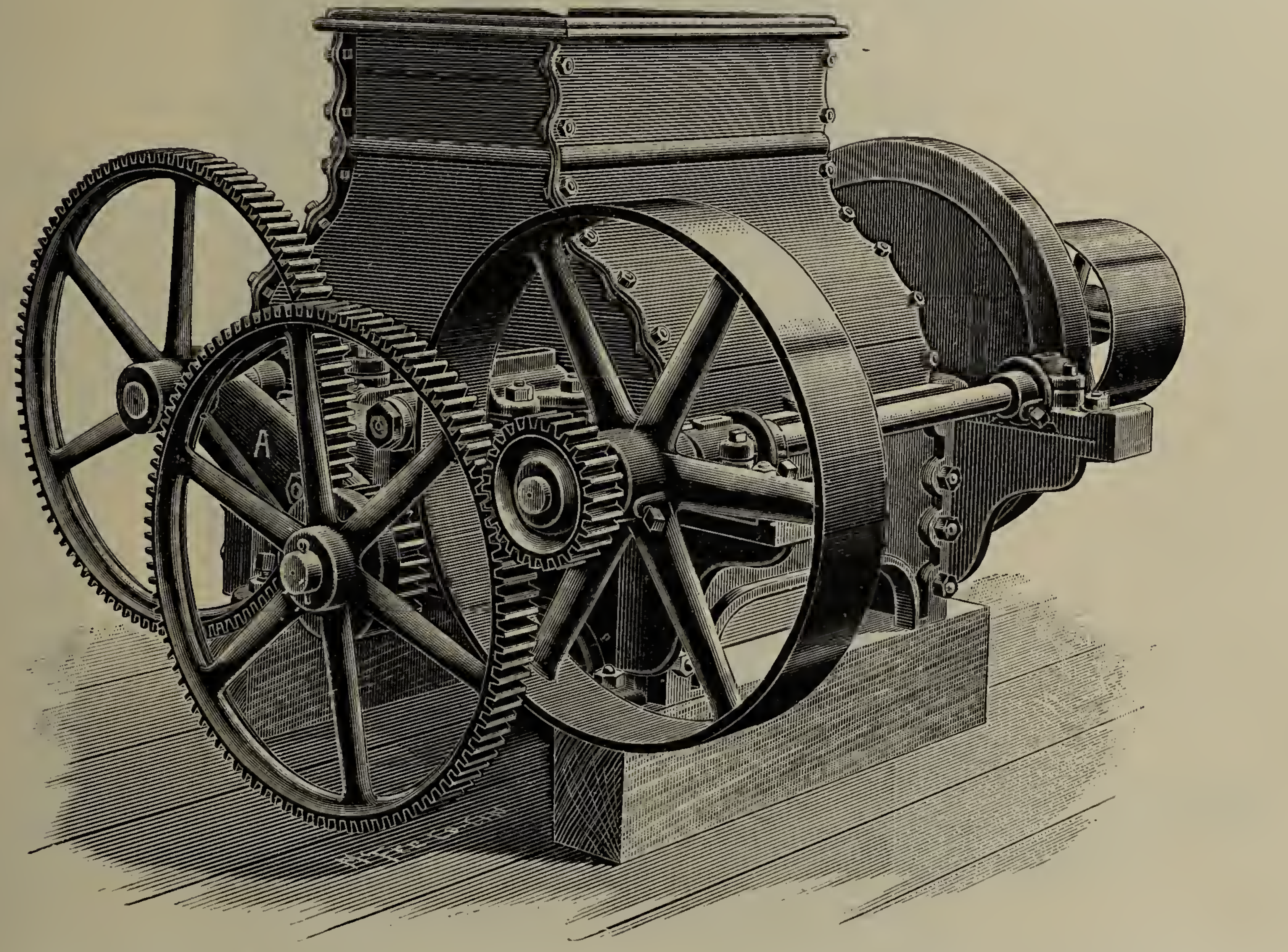
Cheapest and Simplest for Horse and Steam power (16,000 brick per day.)

Send for illustrated circulars to

FREY, SHECKLER & HOOVER, Bucyrus, Ohio.

THE
Time Has Come

When every Brickmaker must awaken to the advanced methods now controlling his line of manufacture and the man that contines to plod along in his grandfather's shoes is going to get badly left. Every manufacturer claims his machine and his method the best and frequently (for want of better) publish the same testimonial—so samely, that one must look through colored specs to see it in a *different light.* This practice combined with false representations has so disgusted the craft generally, that they now fear to trust their own mother. Some machine manufacers have the nerve to state, publish and circulate the assertion that any brick machine having the press-box on the outside will not fill out the end brick. Everyone knows that our press-box is on the outside and the Automatic makes brick and gets there Ely. Also certain agents for a well advertised machine, (largely represented in this paper) reported that they had replaced our "Automatic" both for the "Walker Brick Co." at Aurora, Ind., and for the Southern Ohio Brick and Tile Co., Cincinnati. We therefore beg to state that the "Walker Co." has ordered a "New Automatic" outfit and we now offer for sale *cheap* the would-be replacer. Also, the works of the Southern Ohio Brick Co.—now the Cincinnati Brick Co.—has been nicely swept with a new broom and the "Automatic" plants are used exclusively. Talk is cheap, but talk don't make brick. Progressive brickmakers will watch our ads. for reliable information and send for our new catalogue if something good is wanted. We don't take stock in every yard started in order to make a sale. We propose to get there by merit.



[Our Clay Disintegrator that knocks 'em all out. If your Disintegrator is no good give us a show.

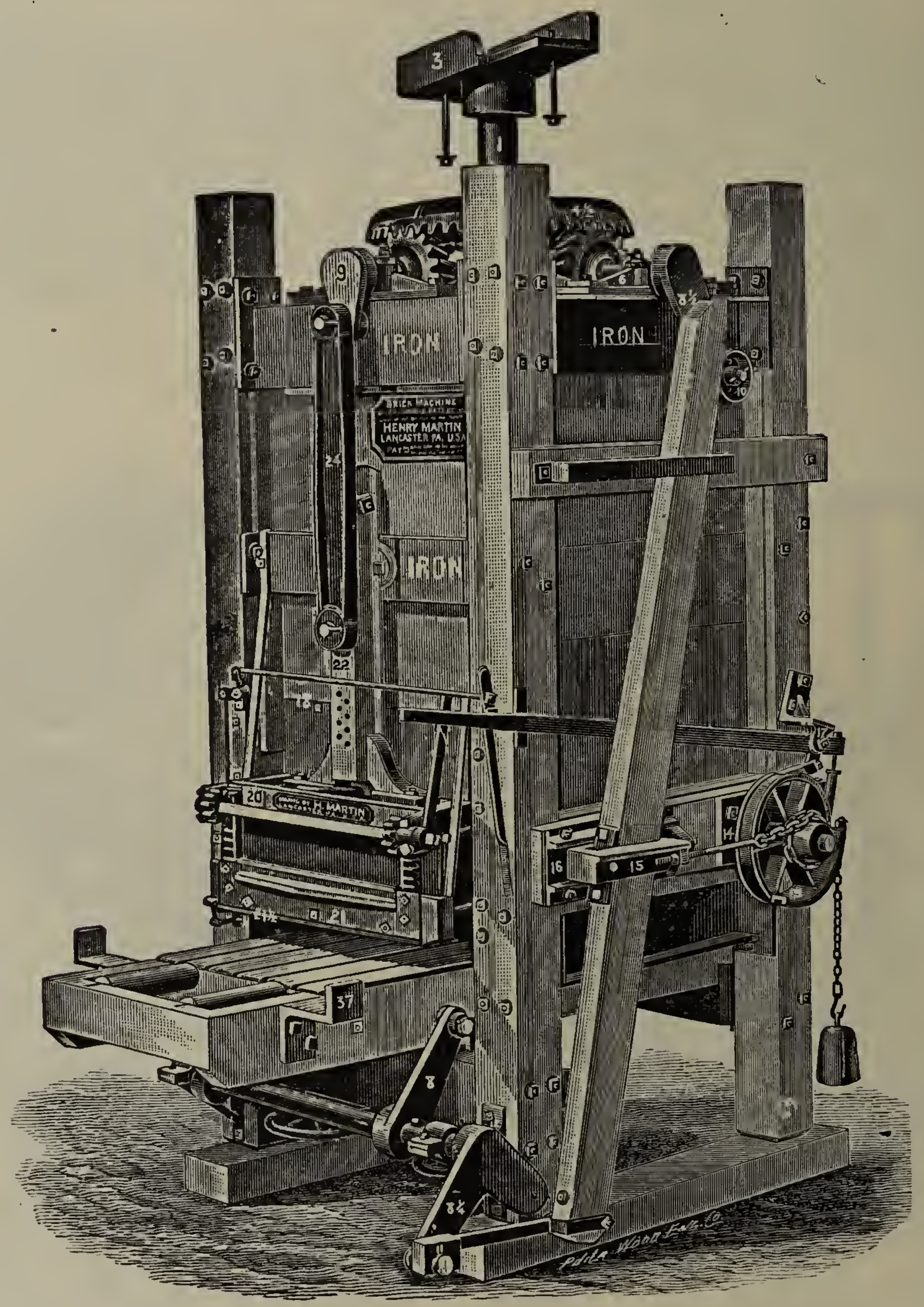
Correspondence solicited. Address

The Grand Automatic Brick Machine Co.,
CINCINNATI, OHIO.

The Henry Martin Brick Machine.

For Steam or Horse-Power.

FOR STEAM OR HORSE-POWER.



FOR STEAM OR HORSE-POWER.

This cut represents our Horse-Power Machine. It has Iron Rails. It is the strongest. It is the best. It is the most simple. It is the most perfect. It does the best work. It works any clay. It does not get out of order. It is not liable to break down. It stands hard usage. It can be changed to Steam Power.

BETTER THAN EVER.

Our machines are this season the Best ever built by our Mr. Henry Martin, whose thirty years' experience has rendered him familiar with the wants of the Trade.

For Strength, Durability, Qoantity of Output and Quality of Work, they have no equal.

Brickmakers make no mistake when they buy the Henry Martin Machine.

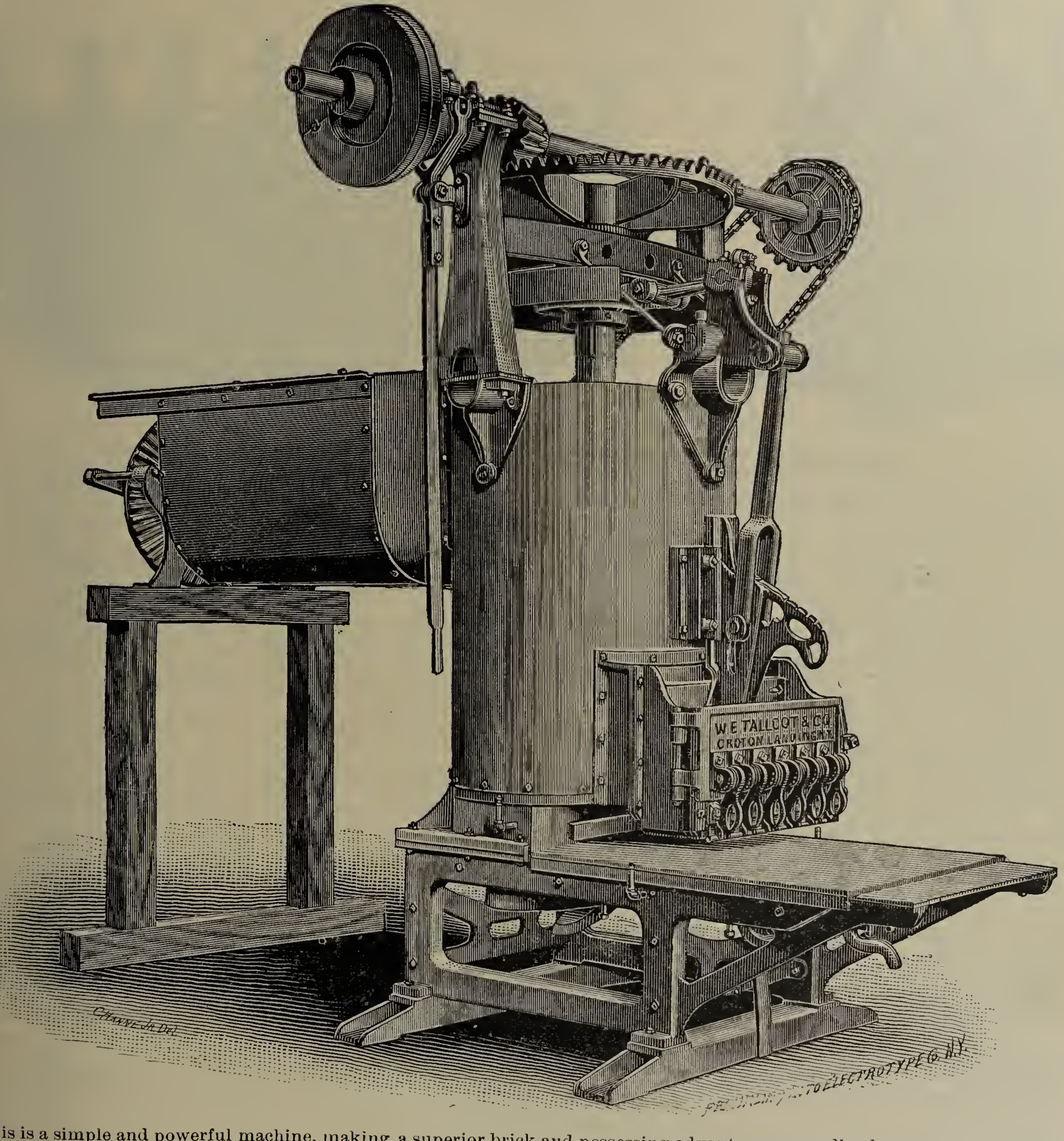
MANUFACTURED BY

The Henry Martin Brick Machine Mfg. Co.,

Send for a Catalogue. LANCASTER, PA., U. S. A.

W. E. TALLCOT & CO'S.

I. X. L. Brick Machine and Improved Pug Mill.


W E TALLCOT & CO
CROTON LANDING N.Y.
TO ELECTROTYPE Co. N.Y.

This is a simple and powerful machine, making a superior brick and possessing advantages over all others. It is the result of ears of experience in using and manufacturing brick machines. Among its advantages are *Great Strength, Simplicity and Durability* ew parts, well protected from sand, yet easy of access for adjustment, renewal and repair. No wood is used in its construction; it is nade all of iron and steel. Perfect automatic action to prevent breakage by stones or other obstructions. Great tempering capacity nd ability to mould very stiff clay. It is easily understood, easily operated, easily kept in order. Quality of brick made, unsurpassed

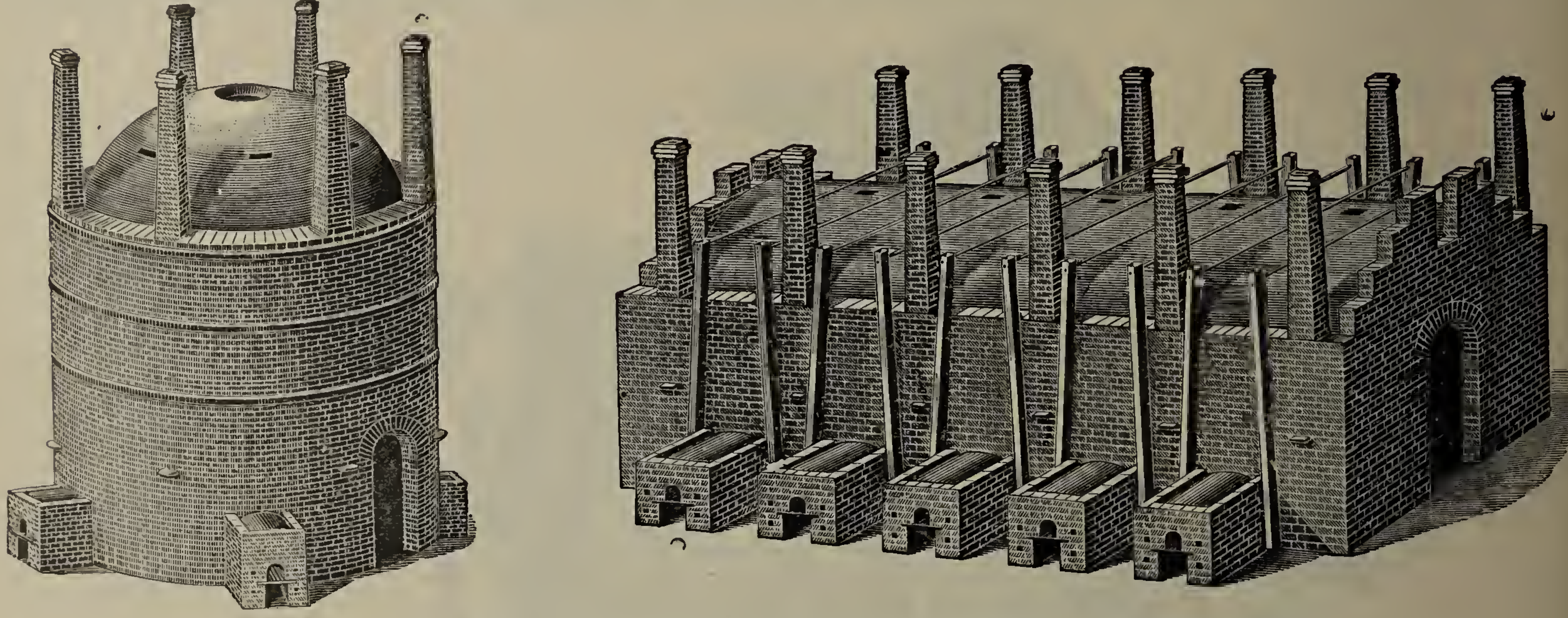
The I. X. L. is eipecially designed and built for heavy work. Weight of Machine and Pug Mill 10,000 pounds. Weight of Mahine without Pug Mill, 7500 pounds. Send for circular and prices.

It will pay you to use the I. X. L.

W. E. TALLCOT & CO.,
Croton Landing, New York

THE EUDALY KILN.

BURNS ANY KIND OF CLAY OR WARE.



THE DOWN-DRAFT KILN.

UNIFORMITY IN BURNING is without a doubt the most essential feature to clay workers. Especially is this the case with fine clays where it is desired to have the wares of uniform color, size and hardness.

In the construction of these kilns particular attention has been paid to this point, by having first carefully examined the subject of drafts and the strength and nature of the different kinds of fuel. The size of the kiln, the size and number of furnaces, flues and chimneys must always sustain the proper relation to each other for a perfect draft. Too much draft is as dangerous as too little. One of the greatest mistakes of kiln inventors and builders is that they utterly disregard the important subject of drafts.

ABILITY TO DIRECT THE HEAT TO ANY PART OF THE KILN is equally as important as a proper draft. Unless the burner has control of the heat in the kiln he has no assurance of a uniform burn. In these kilns if the burner finds the wares too hot in any portion of the kiln he can in a moment shift the heat to any other part where it is not so hot, or what is better, if he has two or more kinds of wares in the kiln, one of which requires more burning than another, he can easily give that portion of the kiln an extra amount of heat. We claim that this is the only kiln in which these results can be attained successfully.

For this reason wares can be burned by this system **more uniformly** than by any other.

Practically there is no difference from top to bottom, yet this is purely a *down draft* kiln. There are no inside dampers or cut-offs. **Everything about the kiln is permanently built.**

ECONOMY OF FUEL AND LABOR is perhaps the second most important feature of any kiln. We hear a great deal said about "economy in fuel and labor," but to understand what is necessary to a fuel and labor saving kiln one should be thoroughly acquainted with all kinds of fuel and the conditions necessary to get the greatest number of heat units out of it, and at the same time **distribute the heat to the burning wares in the most effective manner.**

We claim that our latest improved furnace is the most **complete economizer** of fuel that has ever been invented.

The construction is purely scientific, and is made by first obtaining the chemical requisites necessary to insure perfect combustion and then building a furnace to bring about these results. Different kinds of fuel require a different size and construction of furnace. We use any kind of fuel, soft coal, screenings, oil, gas or wood.

COST OF CONSTRUCTION.—These kilns require no large stack, which ordinarily costs as much as the kiln proper. Many persons think they must have a large, tall stack in order to have sufficient draft to get the bottom of the kiln burned.

This is certainly a mistaken notion.

The things that are required, however, are a correct location and size of furnaces, flues and chimneys with reference to each other and the kiln. When these are properly attained the burner need have no fear about draft.

In these kilns great care has been taken to adjust these relations in such a way that the expensive stack is not at all required, and a much better draft obtained.

DURABILITY.—Each part of these kilns is built with special reference to strength and durability.

The furnaces, which are perhaps the most perishable parts of any kiln, are in these kilns made very strong and durable.

Those parts most liable to burn out can be easily removed and replaced without damage to the other parts of the furnace.

Rules are given by which a builder of these kilns can get the strongest crown and best supports to the kiln.

SIZES.—These kilns can be built either **round** or **square**, and of **any** desired **size**. A number of these kilns are now in use that burn from 150 to 250 thousand bricks at a time. The walls are built **twenty-four inches thick**. They should be lined throughout with fire-brick where the clay is very hard to burn. Good kilns can be made, however, without using fire-brick for any part except the **furnaces** and **bags**. In asking for cost of construction **state size of kiln in feet wanted**, whether the kiln walls, crown or bottom are any or all to be lined with fire-brick.

DRAWINGS and specifications for building kilns will be furnished any who purchase *kiln or yard rights.* We usually can furnish a man to superintend the building if desired.

For further information address

W. A. EUDALY,

64 Johnston's Building, - - - - CINCINNATI, OHIO.

MORRISON'S IMPROVED KILN

FOR -:- BURNING -:- CLAY -:- WARES

Especially adapted to Burning Common, Repressed and Ornamental Brick.

PATENTED IN UNITED STATES AND CANADA.

SUCCESSFUL! DURABLE!

Daily product of our Kilns in the United States, One-Half Million Bricks. Our claims fully substantiated BY OUR PATRONS. We claim ninety to ninety-five per cent. hard brick. Arch bricks all Fronts and Pavers and none damaged—of uniform color. Pressed brick burned without fire-marks—coal screenings preferred for fuel. One fireman for two hundred thousand bricks. The

Only Kiln That Regulates the Temperature of Heat

And directs its course by a system of air drafts, giving complete control of the degree of heat, as well as its anipulation. This system we have covered by letters patent. Any persons using these air drafts are liable to rosecution for infringement.

Read the following testimonial from a recent patron, and another new one from an old patron:

B. Morrison, & Co., Rome, Ga.: Knoxville, Tenn., October 31st, 1888.

GENTLEMEN—I have used your *Improved Kilns* during the past twelve months and cheerfully report the result. We burn our bricks in our Kiln at a cost of sixty-five cents per thousand for fuel and labor; a saving to us, over our old method, of eighty cents per thousand on he two items. My saving in waste brick in the kiln and at the building is fully *ten per cent.*, or sixty cents per thousand in other words. very time I burn your kiln of 300,000 bricks it is a saving to me of *more than four hundred dollars* over the old-process. I find your kiln urable and simple to operate. We use coal screenings for fuel. Have no waste in arches, and burn ninety per cent. hard brick. I have no esitation in pronouncing your kiln a success in every respect, as you make no claims it does not fulfill.

Yours Truly,
REPS. JONES.

B. Morrison & Co., Rome, Ga.: Atlanta, Ga., July 20th, 1888.

GENTLEMEN—We have used your Improved Kilns for three years and during that time have burned upward of a hundred millions in em and wish to emphasize our former statement in regard to your kilns. They are reliable, durable, and the best kilns for our purpose, e have been able to find after investigating many of the various kilns in use, and say to our friends of the trade: If you want kilns that ill burn your brick nearly all hard, and do it every time, burn them economically and without loss, and with little cost for repairs, secure e Morrison Kiln.

CHATTAHOOCHEE BRICK CO., per GEO. W. PARROT, Vice-Pres.

—WE SELL OUR KILN STRICTLY ON MERIT—

☞ For descriptive circulars, additional testimonials, and all information desired, address

R. B. MORRISON & CO.,

ox 335, - - - - ROME, GEORGIA.

The "Little Wonder" and Some of its Friends.

New England Terra Cotta Lumber Co.,......Boston, Mass.
Montreal Terra Cotta Lumber Co.,............Montreal, Can.
The. Rathburn Co.,..................................Deseronta, Can.
Summitt Brick Co.,....................................Cincinnati, O.
Louisville Brick Co.,................................Louisville, Ky.
George Hinchliff,..Chicago, Ills.
E. Harland & Co.,...Chicago, Ill.
Harland & Harmes...Chicago, Ill.
Wm. Dunn...Coon Creek, Minn.
Muscatine Terra Cotta Lumber Co.,............Muscatine, Ia.

O. C. Atchison & Son,..Malvern, Ark.
South Western Terra Cotta Lumber Co.,..Hot Sgrings, Ark.
Raleigh Brick & Tile Co.,..................................Attalla, Ala.
Missouri Terra Cotta Lumber Co.,.................St. Louis, Mo.
Cambria Brick & Tile Co., (2 mills)..................Golden, Col.
Victoria Terra Cotta Lumber Co.,............Melbourne, Aust.
Victoria Terra Cotta Lumber Co.,............Sydney, N. S. W.
J. A. Bender,..Monticello, Ill.
Geo. J. Walters & Co.,....................................Chatsworth, Ill.
Sheldon Tile Co.,..Sheldon, Ill.

C. B. Woodley,..................
..................Sioux City, Ia.

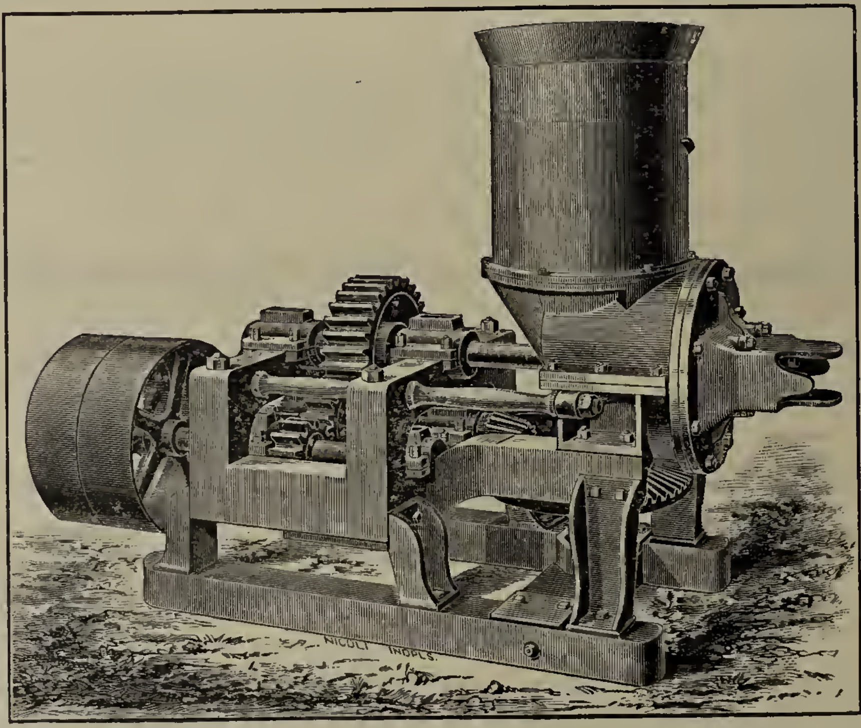
Montserrat Mining Co.,......
..................Montserrat, Mo.

T. H. Boyd & Co.,...............
................Montserrat, Mo.

St. Joseph Press Brick Co.,...
....................St. Joseph, Mo.

H. H. Stukenberg.,...............
...............Kansas City, Mo.

A. V. McKim.....................
.... Kansas City, Mo.



Lincoln Coal Co.,..................
.........................Lincoln, Ill.

S. Kroose,.............................
...........................Lamoile, Ill.

Belvedere Brick & Tile Co.,..
.....................Belvedere, Ill.

H. Ammon,.........................
.........................Decatur, Ill.

T. A. Hodge,.......................
.........................Kirklin, Ind.

Lanum & St. Clair,..............
..................Templeton, Ind.

Norcross Bros...Kansas City, Mo.
Kansas City & Wyandotte Press Br'k Co., Kansas City, Mo.
McBride & Patterson, (2 mills)..................Kansas City, Mo.
Carter, Langworthy & Co., (2 mills).........Kansas City, Mo.
Wichita Terra Cotta Lumber Co ,...................Wichita, Kan.
J. S. Morse & Co.,..Horton, Kan.
Beattie, Benning & Ellis,..............................Atchison, Kan.

Vanhorn & Hudson...Boswell, Ind.
W. B. Owens,...Hobart, Ind.
S. W. Tanner,...Ashland, Wis.
Sanborn Brothers,...Ashland, Wis.
H. Johnson,..Ludington, Mich.
Pidgeon Brothers,...Salem, O.
Greenler & Whetstone,.......................................Defiance, O.

☞ For full particulars regarding the "LITTLE WONDER" and a full line of Crushers, Pug Mills and other clay working supplies, address

THE WALLACE MFG. CO.,

FRANKFORT, INDIANA, U. S. A.

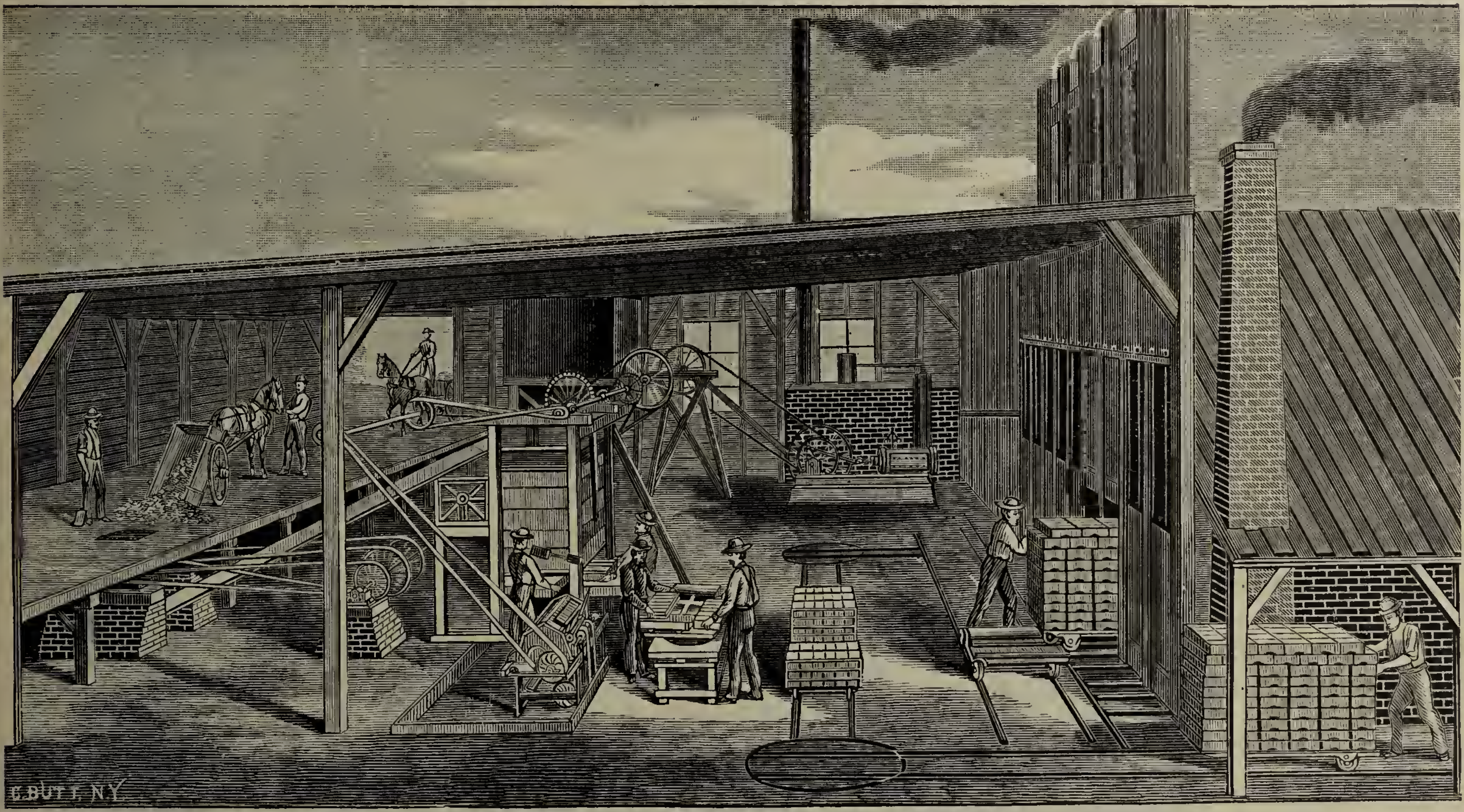
SHARER'S IMPROVED DRYER

* * *

☞ More than one hundred now in use **DRYING SUCCESSFULLY** Soft Mud Brick, Stiff Mud Brick, Pressed Brick, Fire Brick, Hollow Brick, Tile, Plaster, Architectural Terra Cotta, Terra Cotta Lumber, Peat and Lumber. ☜

* * *

No other Dryer in existence can successfully dry such a variety of Materials.



23 are now in process of Construction and under contract to be built this Spring.

The Only Successful Soft Mud Brick Dryer in Existence.

Will also dry Stiff Mud, Semi-Dry and Pressed Bricks at 50 per cent. less cost than any Steam Drier.

No other Dryer will Guarantee to dry Soft Mud Brick. I Guarantee to dry any kind of Bricks.

It is not a Direct Heat Dryer, nor a Steam Heat Dryer. It is a Radiated Heat Dryer. The heat being produced from Coal, Wood, Coke, Oil, Gas or any kind of Fuel, and Radiated through Brick or Metal floor. The heat can be so graduated as to successfully dry the most Tender or Refractory Clays without damage. While in a Direct Heat Drier the product of combustion coming directly in contact with the material to be dried will warp, check and crack in most cases. In a Steam Drier the heat cannot be graduated. Neither can heat be produced from Steam near as cheaply as from the Fuel Direct. With a Steam Dryer it is necessary to run one or more Boilers and Exhaust Fans day and night. There is No Machinery whatever necessary to operate my Dryer. Hence the wear and tear and expense of operating is reduced to the minimum.

References and all information given by letter or otherwise. Address,

GEORGE W. SHARER, Proprietor,

ED. H. CALLAWAY, Gen'l Agt., 72 Redde St., New York.
E. A. KING, Special Agt. New England States, 48 Congress St., Boston, Mass.
HUGH CAMERON, Toronto, Ont., Special Agt. Dominion of Canada.

TERRE HAUTE, INDIANA.

Improved Eureka Dry Press Brick Machine.

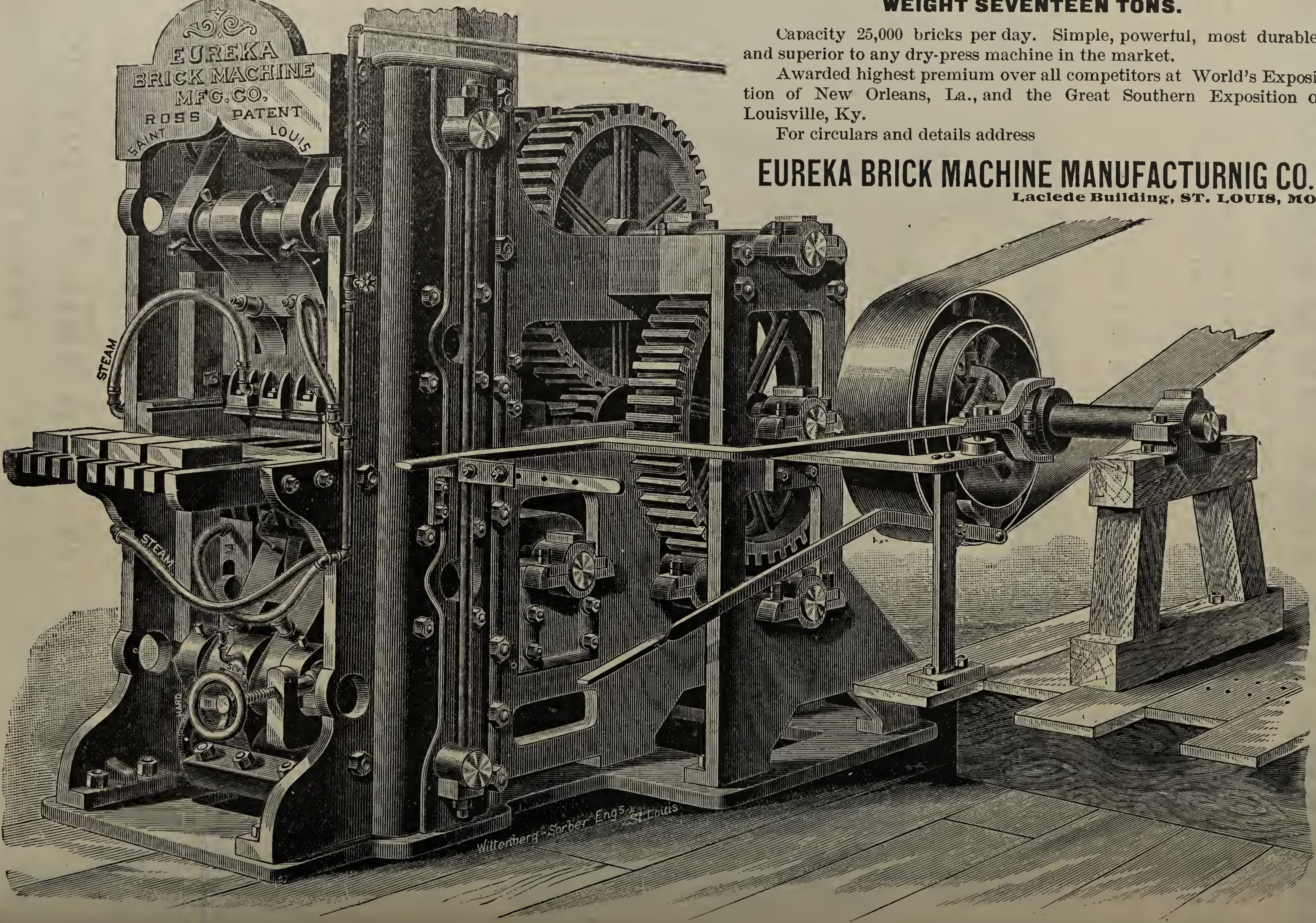
WEIGHT SEVENTEEN TONS.

Capacity 25,000 bricks per day. Simple, powerful, most durable, and superior to any dry-press machine in the market.

Awarded highest premium over all competitors at World's Exposition of New Orleans, La., and the Great Southern Exposition of Louisville, Ky.

For circulars and details address

EUREKA BRICK MACHINE MANUFACTURNIG CO.
Laclede Building, ST. LOUIS, MO.

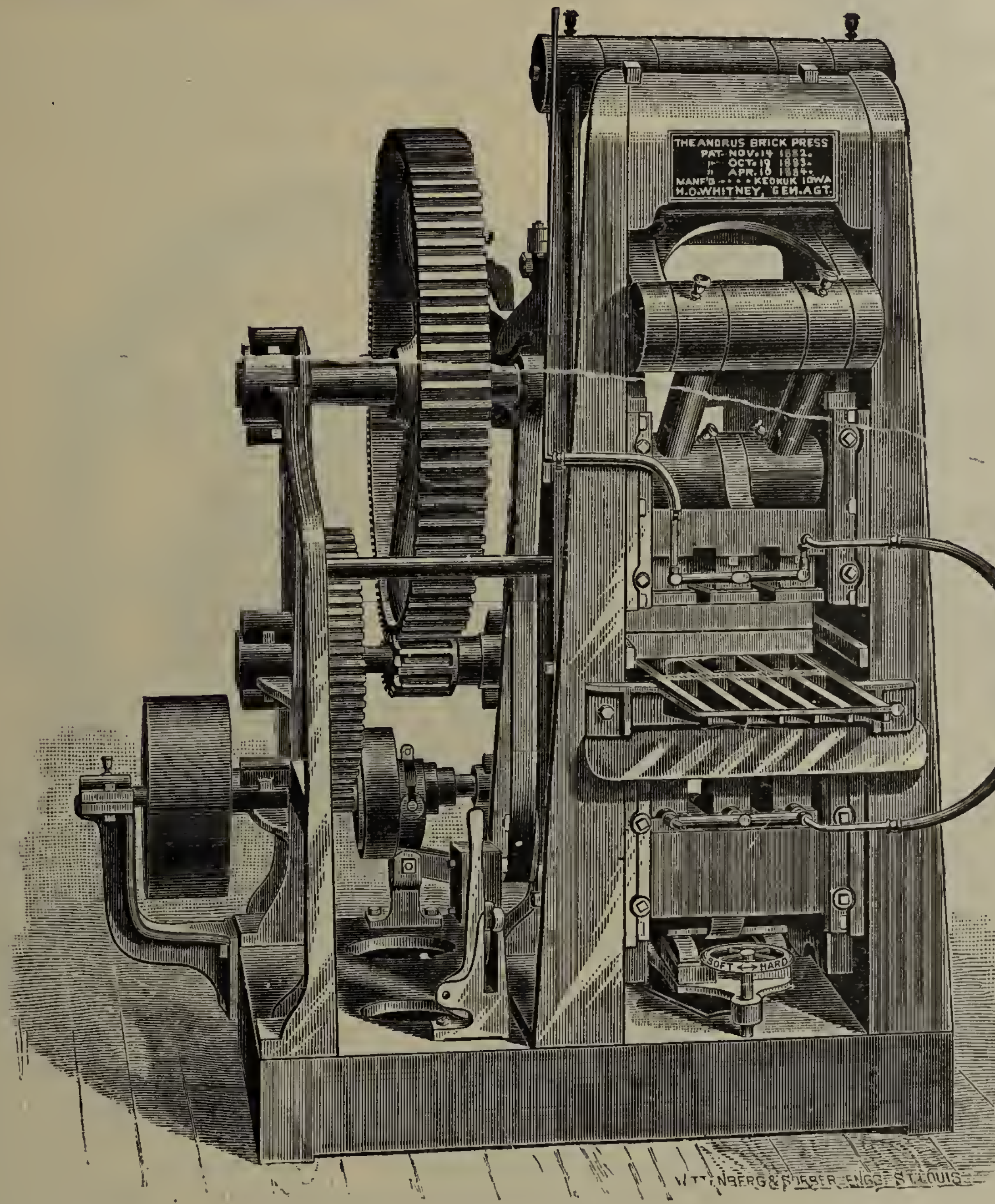


EASTERN AGENCY, 1321 F STREET, N. W., WASHINGTON, D. C., FRANK P. STONE, AGENT.

—THE—

Improved Andrus Double Pressure Brick Press.

UNRIVALLED FOR SIMPLICITY, POWER AND DURABILITY.


THE ANDRUS BRICK PRESS
PAT. NOV. 14 1882.
" OCT. 19 1883.
" APR. 10 1884.
MANF'D • • • • KEOKUK IOWA
H.O. WHITNEY, GEN. AGT.
STEAM DIE HEATER
SOFT ⟷ HARD

The Pressed Brick made on the Andrus Machine have been tested by the U. S. Government and adopted for fronts in Government Buildings.

Built at our OWN FACTORY with heavy forged STEEL pressure arms and fully guaranteed against breakage. Not an experiment but a TRIED and PROVEN success.

60 machines in successful operation the past season. Examine it before purchasing.

Ittner Bros., St Louis, Mo., using the Andrus Presses produced 36 large kilns of brick of unsurpassed quality he past summer.

Samuel J. Rose & Son, Chester, Pa., and many others have made a splendid success.

The Andrus Press, Clay Crushers and Pulverizers can be seen in operation at all times at Our Factory.

Send for descriptive circular and reference, address

H. O. WHITNEY, Gen'l Agent,

General Office and Factory, KEOKUK, IA. (Mention the Clay-Worker.) KEOKUK, IOWA.

St. Louis Iron and Machine Works, Iron Founders and Builders of Heavy Machinery.

ESTABLISHED 1854.
INCORPORATED 1875.

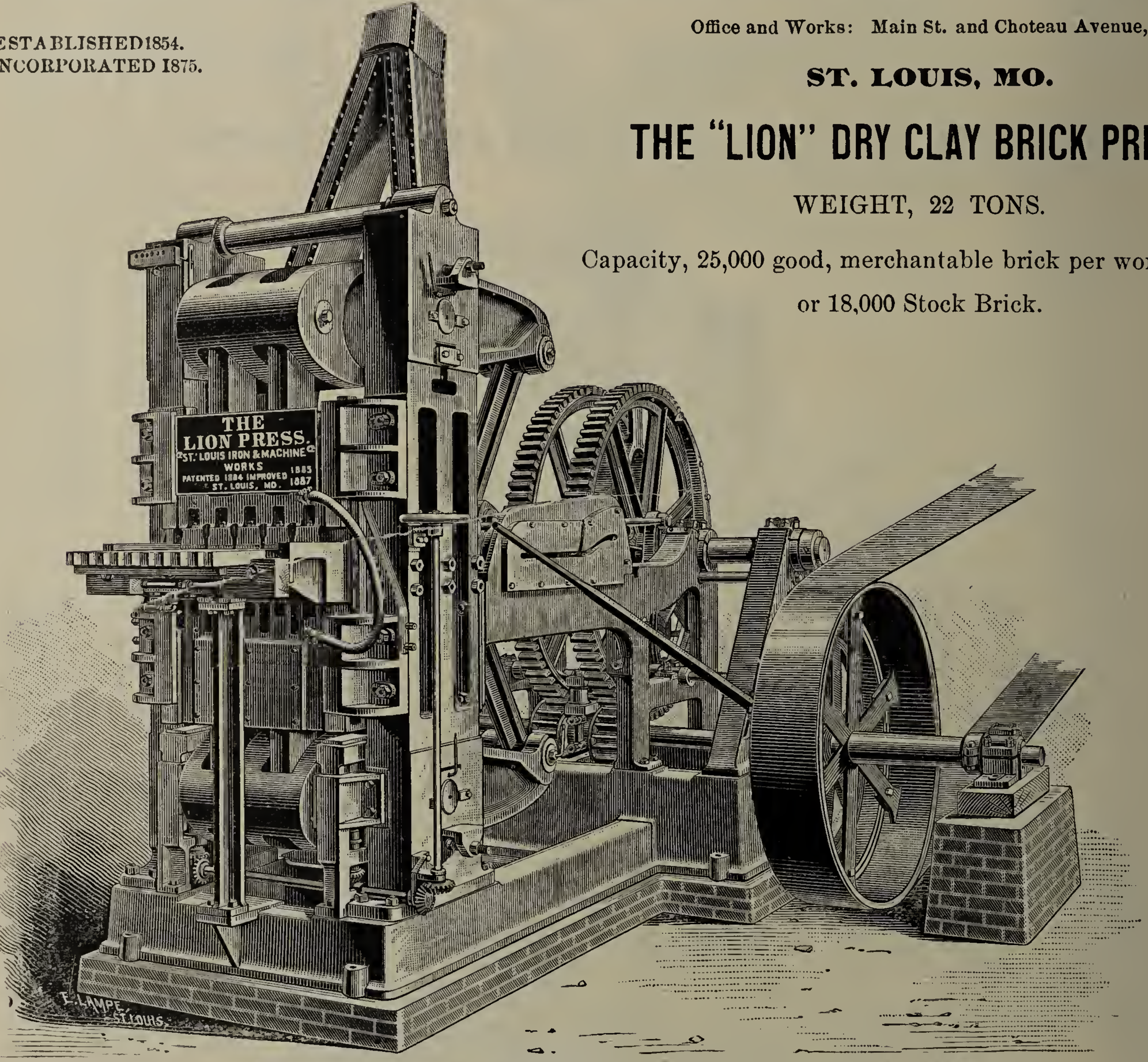
Office and Works: Main St. and Choteau Avenue,

ST. LOUIS, MO.

THE "LION" DRY CLAY BRICK PRESS.

WEIGHT, 22 TONS.

Capacity, 25,000 good, merchantable brick per working day, or 18,000 Stock Brick.


THE LION PRESS.
ST. LOUIS IRON & MACHINE Co WORKS
PATENTED 1884 IMPROVED 1885 1887
ST. LOUIS, MO.
E. LAMPE ST. LOUIS

We claim the following essential features and advantages for our Machine:

1. The main feature of this machine is its great strength, power and durability. The pressure on each brick being 40 tons, and the working parts are so strongly constructed that there is no spring or give under this working strain. 2. The great simplicity and openness of framing and construction, so that every part of the machine is to easily accessible for inspection, lubrication and adjustment, thereby reducing the necessary repairs, incidental of every Brick Press, to a minimum. 3. Pressing 5 bricks at each revolution of Machine, keeps the regular force of off-bearers and setters fully employed, which a 4 Brick Machine cannot do. 4. The adjustment of machine from common to stock brick and vice-versa, can be made in a few minutes' time.

Besides the Press, we manufacture and furnish a complete set of clay preparing Machinery, Elevators, Mixers, and Rollers; also Engines and Boilers complete. We also build different kinds of Steamboat Machinery and Stieam Boilers, Corliss Engines, Cotton Compresses, Water Work Plants, Coal and Mineral Mining Machinery, Bridges Work, Hoisting Travelers, Cranes and Elevaters; also general and large castings and Machinery. Any further information cheerfully given.

TESTIMONIALS.

St. Louis Iron and Machine Works, St. Louis, Mo. KANSAS CITY, MO., September 28, 1888.

GENTS: The two "Lion" Presses I bought from you about two years ago have given me entire satisfaction. As a dry clay press I think they have no superior. I prefer the "Lion" to the "Hydraulic". Ever wishing you success with the "Lion," I am,

Very Truly Yours, DRURY UNDERWOOD.

OFFICE OF
TENNESEE BRICK MANUFACTURING CO.,
NO. 7 MADISON STREET, MEMPHIS, TENN., September 28, 1888.

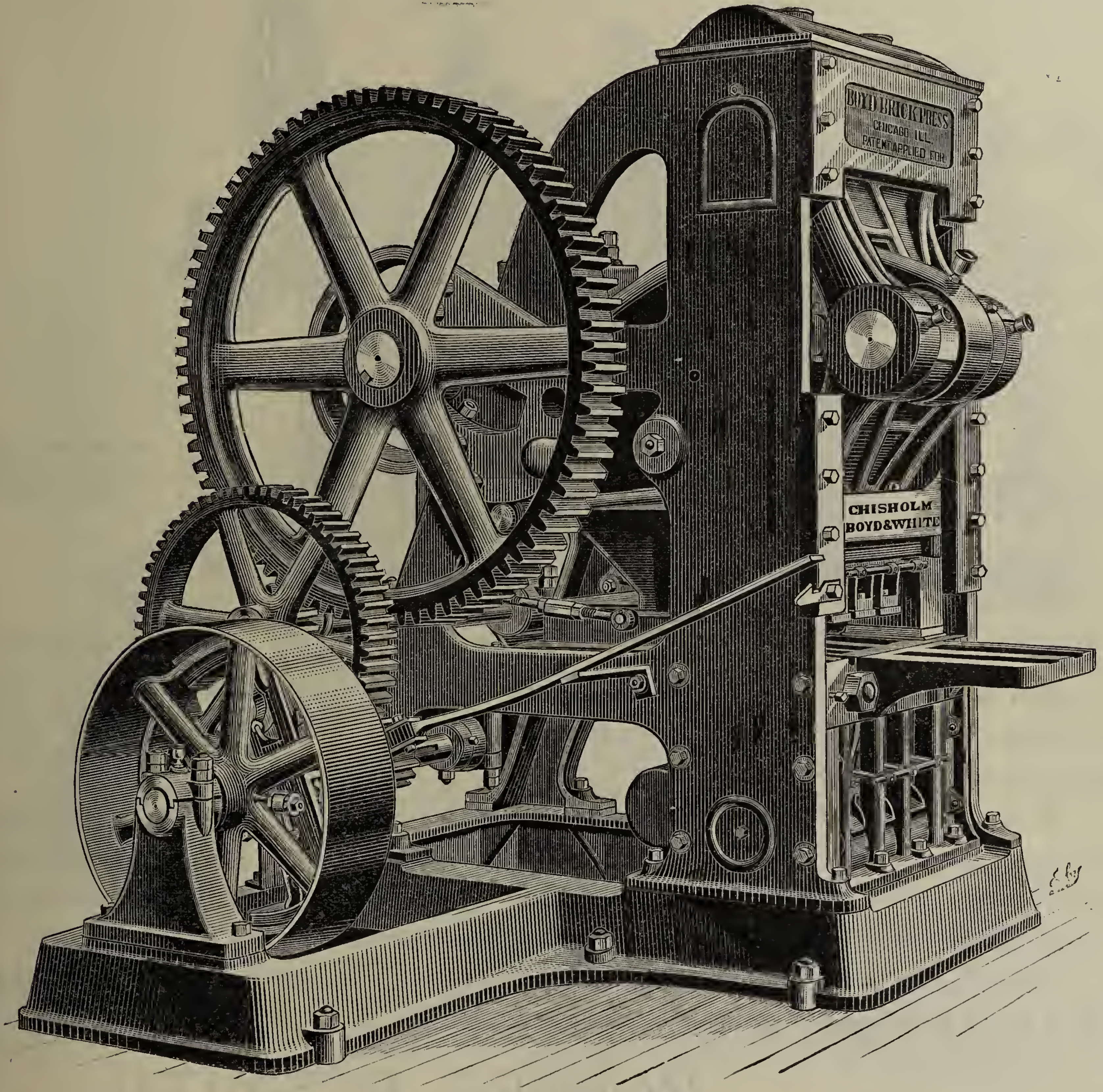
St. Louis Iron and Machine Works, St. Louis, Mo.

GENTLEMEN: In reply to yours of 25th inst., we beg to say that our Company contracted with you last spring for one of your "Lion" Brick Machines, having concluded, after our President and Superintendent had thoroughly investigated most of other machines, including the Hydraulic, that yours possessed more advantages and promised better results. In due course the machine was delivereed, set up and put into operation. After having operated it all summer to full capacity, we are more than pleased with results and can heartily recommend the Mahcine to any one contemplating a purchase. To fully appreciate the merits it must be seen performing work.

Wishing you that eminent success which you so well merit we remain Yours Truly, C W. EDMONDS, Sec. and Treas.

THE BOYD BRICK PRESS

Will make a greater quantity of Perfect Brick (of maximum weight) per mould for a consecutive number of days than any other Semi-Dry Brick Press in the world and Superior in Quality to Hydraulic Pressed Brick.



☛ Correspondence Solicited.

CHISHOLM, BOYD & WHITE,

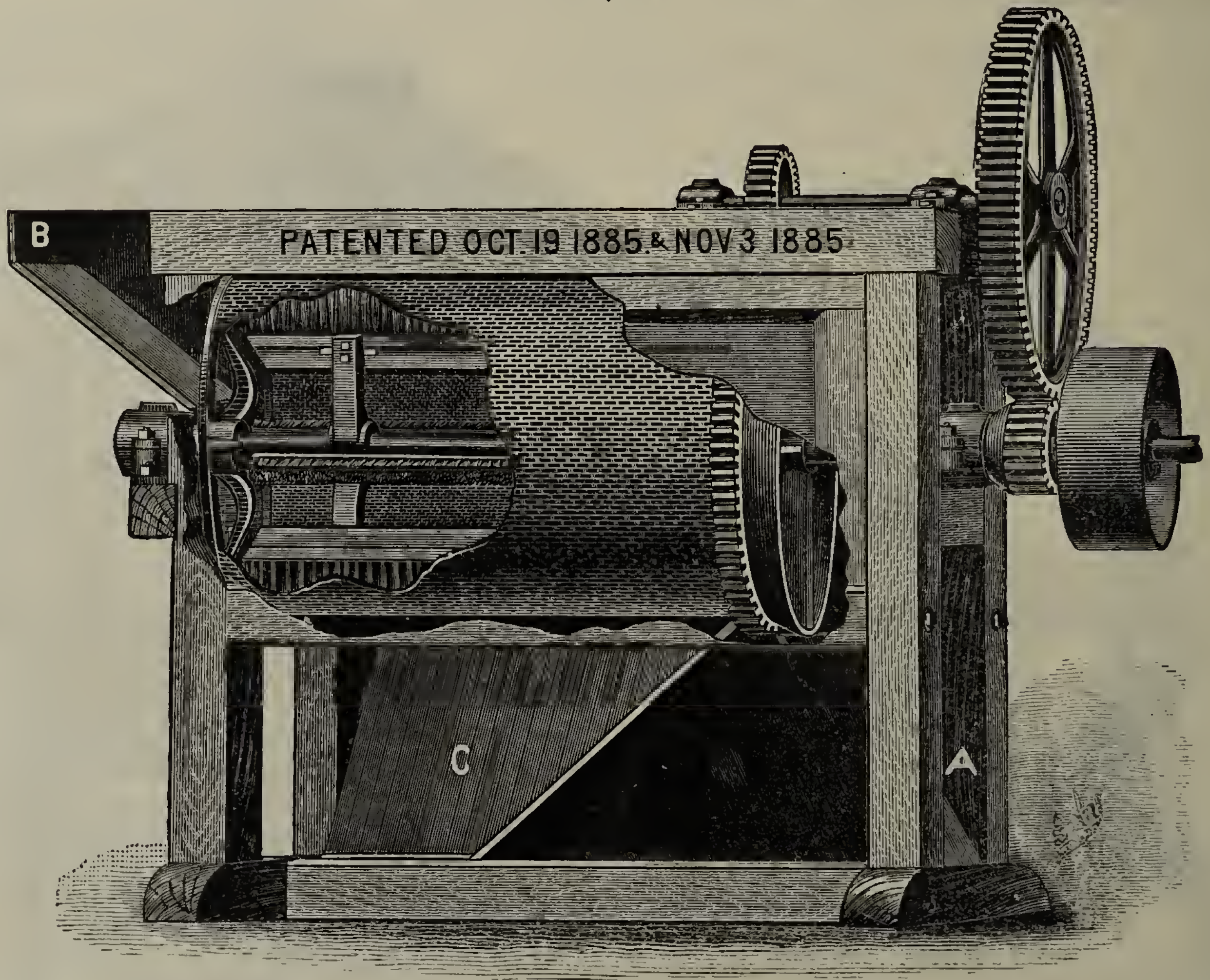
86 Adams Express Building, CHICAGO, ILL.

THE BOYD

Clay Pulverizer and Stone Separator.

ACKNOWLEDGED THE BEST.

B.
Dry or Semi-Dry Clay goes in here.



C.
Pure Clay comes out here.

A.
All Stones, Pebbles & foreign substances come out here.

I OFFER to those engaged in Clay-working, a machine that has no equal for removing Stones, Roots, Pebbles, or other foreign substances, and reducing Clay to Granules, for Dry or Semi-Dry Press Brick making, Terra Cotta, Tile, or other articles manufactured from Clay, which require a *Strictly Pure Quality.*

It is especially valuable to makers of Fine Press Brick, Tile, or Terra Cotta, as the lime-stones and pebbles are removed entire—not crushed and left in the clay. This machine is not a crusher, and will not pulverize wet clay or mud. The clay to be pulverized in this machine must be in a dry or semi-dry state.

Its capacity is from 40 to 60 tons per day of ten hours, and requires only from 4 to 6 horse-power to drive.

ROBERT B. SMITH,
Licensed Manufacturer.

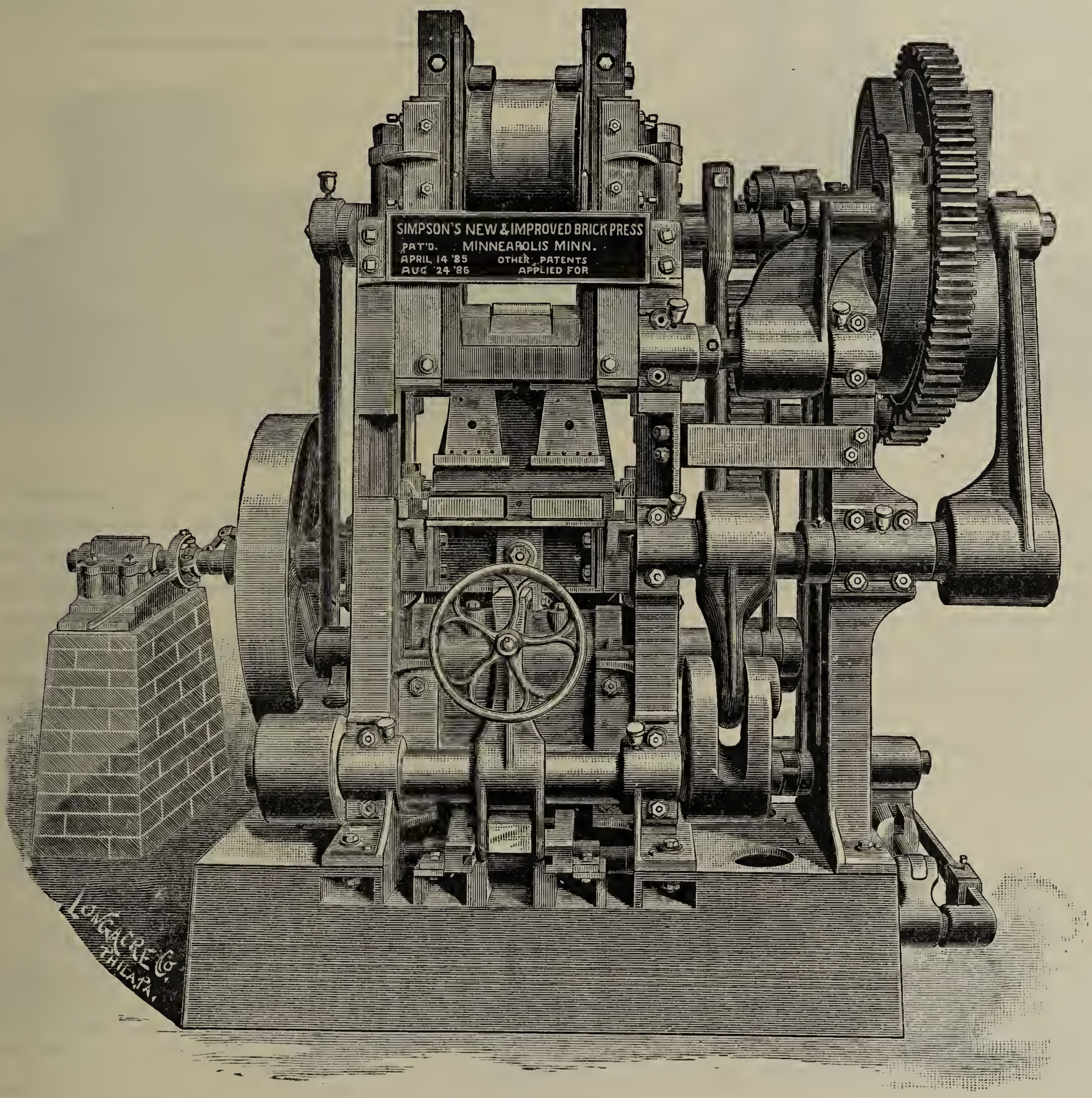
OFFICE, NOS. 116 and 118 DEARBORN STREET, ROOM 55.
CHICAGO, ILL.

❋ Agency of the Carman Dry or Semi-Dry Press Brick Machine. ❋

SIMPSON'S NEW

AND

IMPROVED BRICK PRESS.


SIMPSON'S NEW & IMPROVED BRICK PRESS
PAT'D. APRIL 14 '85 AUG '24 '86
MINNEAPOLIS MINN.
OTHER PATENTS APPLIED FOR
LONGACRE Co. PHILA, PA.

Send for particulars and prices

SIMPSON BRICK PRESS CO.,

44 Tribune Building, **MINNEAPOLIS, MINN.**

I. & M. WOLFF & COLEMAN

THE "IRON CLAD"

- Dries Brick and Tile with Exhaust Steam from Engine in day-time and Live Steam at night.
- Pipes Thoroughly Isolated in Iron Clad Box.
- Easily Accessible to Examine and Repair.
- Not Dependent upon Direction of Wind or the Condition of the Atmosphere.
- Features Radically Different from any other Drier.
- Is Broadly Secured by Bona Fide Patents.
- Buildings Not Expensive to Construct.

Patentees and Sole Builders

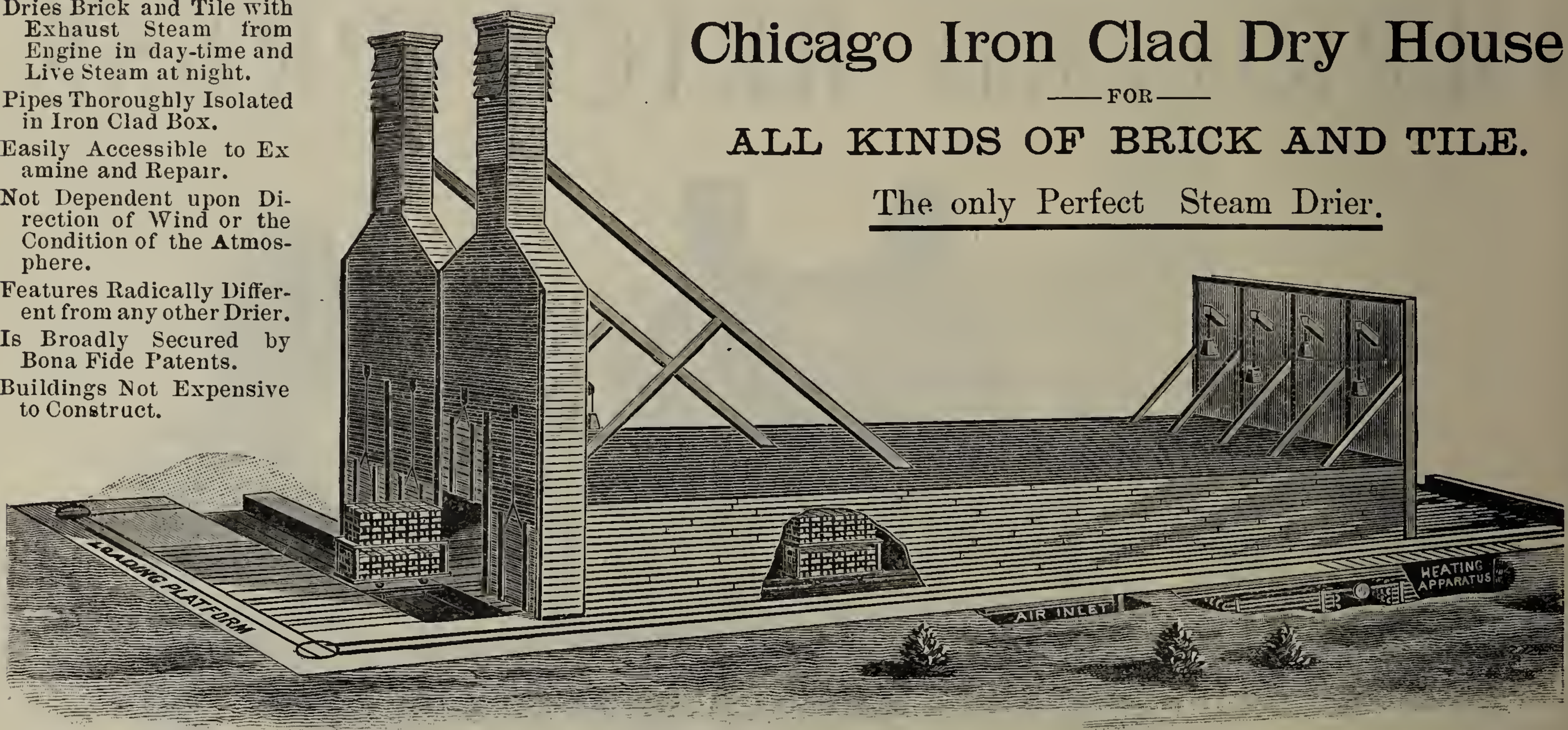
—OF THE—

Chicago Iron Clad Dry House

—FOR—

ALL KINDS OF BRICK AND TILE.

The only Perfect Steam Drier.



This Dry House is a combination of the Drying Floor and Tunnel System. The radiation from the Iron Floor extending over the heating coils dries the lower tiers of bricks. The perforation of the Iron Floor gives an even distribution of the heat and prevents cracking. The steam heat is not so intense as to melt down the bricks or bake them. The bricks are dried uniformly; they come out smoothly and burn evenly, with a good ring. The water-smoke is drawn off rapidly as made and the drying is even and gradual. Stiff mud bricks are haked on double deck cars and thoroughly dried in 24 hours. Soft mud bricks are dumped on pallets and cars carry the same through Dryer in 24 hours. Semi-dry and dry pressed bricks are specially provided for and can be dried without injury. We can convert other Dryers into our system, thereby improving product and capacity. Our buildings are constructed en-entirely of wood; are simple, cheap and easily erected. We furnish complete steam heating apparatus with pipes and connections, Iron Cars, Turn-tables, Transfer Cars, Rail and superintendence. Confer with us before contracting elsewhere. We will save you money time and trouble. State character of bricks made, name of machine used and capacity required.

Corning, N. Y., February 11, 1889.

Messrs. I. & M. Wolff and Coleman,
102 W. Washington Street, Chicago, Ills.:

Gentlemen—Your Mr. W. C. Byrne arrived here one week ago to see how the Dryer which you people put in for us was doing its work. A part of the time that he has been here the mercury has been 10 degrees below zero and the brick has dried as well as in midsummer. The Dryer, size 28x76, is doing all that you claim for it and we are sure if your directions are properly carried out it will dry more than 20,000 brick per 24 hours. Before we purchased this Dryer from you we visited several places where the hot air Dryers are in use and had partially decided to put in one of them; but seeing your Chicago Iron Clad Steam Dryer, advertised in the Clay-Worker, we commenced to investigate the merits of your Dryer. Of course we were told that steam was a failure; but we saw it different and we must say that this Dryer has been put in by you people to our entire satisfaction.

Yours respectfully,

CORNING BRICK WORKS, by C. M. Rubright, Sec'y & Treas.

I. & M. WOLFF & COLEMAN,

PATENTEES AND SOLE BUILDERS,

Write for catalogue.

No. 261 Dearborn St., Chicago, Ills.

The Chicago Iron Clad Dry House

The merits of this successful Drier are meeting with universal appreciation, and we are at present constructing Driers for the following brick manufacturers:

Chattahoochee Brick Co., Atlanta, Ga.,
Daily Drying Capacity, 100,000.

Barrington Brick Co., Barrington, R. I.,
Daily Drying Capacity, 100,000.

C. A. Hawks, St. Paul, Minn., Daily Drying Capacity, 50,000.

Corning Brick Works, Corning, N. Y.,
Daily Drying Capacity, 25,000 Stiff Mud Brick.

South Baltimore Brick Co., Baltimore, Md.,
Daily Drying Capacity, 30,000 Soft Mud Brick.

Cleveland Brick Co., Wickliffe, O.,
Daily Drying Capacity, 30,000 Stiff Mud Brick.

W. D. Isaac, Charleston, W. Va.,
Daily Drying Capacity. 25,000 Stiff Mud Brick.

T. W. Stanland, Summerville, S. C.,
Daily Drying Capacity, 25,000 Stiff Mud Brick.

Carteret Brick Works, Carteret, N. J.,
Daily Drying Capacity, 30,000 Semi-dry Pressed Brick.

Anna River Brick Co., Detroit, Mich.,
Daily Drying Capacity, 50,000 Soft and Stiff Mud Brick.

ADDRESS

I. & M. WOLFF & COLEMAN,
CHICAGO, ILL.

DRYERS! DRYERS! DRYERS!

FOR TILE, FOR DRY PRESSED BRICK, FOR SEMI-DRY PRESSED BRICK, FOR STIFF MUD BRICK, FOR SOFT MUD BRICK.

It will pay you to have your bricks thoroughly and equally dried before setting in kiln. You can dry them more economically in

THE IRON CLAD DRYER

Than in the kiln, besides getting a more uniform burn and better bricks. Handling and wheeling bricks costs money, and the bricks are often marred and in bad shape when they go to the kiln.

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I. & M. WOLFF & COLEMAN,

261 Dearborn Street,

CHICAGO, - - ILLINOIS.

THE CLAY-WORKER

VOL. XI. INDIANAPOLIS, IND., MARCH, 1889. No. 3

Written for the Clay-Worker.

EXAMPLES OF AMERICAN BRICK AND TERRA COTTA WORK.

No. 14.

THE PHENIX INSURANCE COMPANY'S BUILDING, CHICAGO.

The Phenix building was designed by the well-known architects, Messrs. Burnham & Root, of Chicago. It extends the entire block on Jackson Street, opposite the Grand Pacific Hotel, from Clark Street to Pacific Avenue, and so has a frontage of 216.5 feet, while the depth on the other two thoroughfares is something over fifty feet. There are ten high stories—the topmost of which really contains two, with windows on all four sides, flooding with light the great space occupied by the Phenix Company—and the external effect is admittedly one of the finest and most imposing presented by any business building in Chicago. The first two stories are of Vert Island stone. The third story is half of stone and half of brick, and above the third story it is entirely of brick and terra cotta. The entrance, midway in the Jackson Street front, has a clear span of twenty-four feet. The vestibule is 20 by 45 feet. The peculiarity of the treatment of the fronts is the large number of strongly marked and highly enriched bay windows, which extend from the third story up to the floor of the ninth inclusive, and give to the offices in which they open great additional depth and outlook on the street. The cornice is in the form of a strongly projecting balcony, with richly carved parapet, which extends around on the level of the tenth-story floor, and on this balcony all the windows of the general offices of the company open. The two lower stories, of pinkstone, are closely related to each other in general grouping, the third story is isolated, the fourth and fifth stories are grouped together, and the sixth, seventh, eighth and ninth are thrown in one large grouping. The tall story, fully twenty-two feet high, occupied by the company, is strongly accented in the design of the fronts, and the interior space is not broken by a single column.

If the exterior is harmonious in design and color, on passing within the great arch of entrance you cannot but admire still the strength and delicacy of outline and treatment. White marble everywhere in the grand entrance, in the massive steps, in the elevator arch, along every hallway, the glowing surfaces reflecting and still more multiplying the shafts of light from the scores of plate-glass windows. All the offices are in plain arrangement, finished in Cuba mahogany. The nine tiers of Phenix offices are among the most secure, the most thoroughly and elegantly finished, and the best lighted to be found anywhere.

THE PHENIX BUILDING, CHICAGO.

The Northwestern Terra Cotta Co., of Chicago, have a special compliment in the Phenix Building. Anything finer than the terra cotta display in the enriched bow windows cannot be found in Chicago, and the same artistic design and finished execution mark all their product throughout the building, indeed throughout the city.

St. Louis pressed brick could not have a better monument than the Phenix Building, the extensive contract being filled by Lockwood & Kimbell, of Chicago, the well-known dealers in this material, as also Trenton, Philadelphia, Zanesville, Milwaukee, and the other fine grades of pressed brick, which they ship by the carload throughout the Northwest.

The building is lighted throughout by electricity by the Edison incandescent system and there are five of W. E. Hale & Co.'s elegant passenger elevators, indeed every convenience known to modern architecture has been supplied regardless of expense. Four hundred thousand dollars was paid for the site and one million dollars for the building making the total investment nearly one and a half million dollars.

IN an article on "Architectural Brickwork" in the London *Building News*, the resuscitation of the long dormant art of brick-cutting, moulding and carving is considered due to the Venetian Gothic craze and Queen Anne revival. The writer considers that to "Mr. Ruskin, the late Mr. Street, R. A., Mr. Norman Shaw, A. R. A., and Mr. Alfred Waterhouse, R. A.—worthy pioneers of the movement—we owe brick buildings that will compare with those of the previous century. If our brick architecture has not yet achieved a definite place in our recent history, it is because the trade of brickmakers and the crafts engaged in the work have failed to reach the standard which they attained in other countries and times. The Babylonish bricks were moulded and impressed with inscriptions of cuneiform character; they varied in size and shape, some over a foot square and three inches thick, others smaller, of less thickness; the adobes or sun-dried ones were laid in clay, bonded with matting of reeds, covered with bitumen every few courses, while the burnt bricks were laid in hot bitumen. There are found triangular-shaped or corner bricks, arch-shaped bricks and other forms, showing that the manufacture had reached a high stage.

Written for the Clay Worker.

SOME PECULIAR PROPERTIES OF CLAY.

BY PROF. R. T. BROWN.

Perhaps it is owing to the very general distribution of clay, that so little attention has been paid to its chemical composition and physical properties. It is a weakness of human nature that we search for rare objects and devote special attention to them, while that which lies before us in every-day life, we pass with the slightest notice. The three earths that make up the great mass of the globe are generally present in the clay we tread on every day—two of them always. These are silica, alumina and calcia—or, speaking plain English, flint, clay and lime. The last two of this list are metallic oxides, or rusts, and the last may be, though it has not been demonstrated. These are rarely, if ever found in nature in a pure state. Clay, as we commonly find it is a compound of alumina and silica, in chemical union; and generally mixed with silica in the form of sand, uncombined. The gems known as rubies and sapphires are crystals of alumina. They rank next to the diamond both in hardness and in value. Pure alumina may be obtained by dissolving alum, and adding soda or ammonia to the solution, when the alumina will be precipitated in the form of a soft white powder, insoluble in water.

The primitive source from which clay, in its common form, is derived is generally admitted to be feldspar, an ingredient entering largely into the composition of granite and other crystalline rocks. From the decomposition of these we have the secondary forms of slates and clay shales, and these shales decomposing give us our beds of clay with their various mixtures of free silica, lime, iron, magnesia, etc. Feldspar is a crystallized silicate of alumina. When the feldspar loses its crystalline form by exposure to atmospheric agencies, it appropriates two equivalents of water, which gives it the form of an hydrated compound. On the presence of this water of hydration depends the plastic property of clay, which gives it its chief value. Chemists have doubted whether this water was chemically united with the compound or merely held by the powerful absorbent property of the alumina; but if this was the nature of its union, it would be liberated in the form of steam at a temperature above the boiling point. But it requires a temperature above a red heat to liberate it; and when once driven off it can never be restored. Well-burned clay may be reduced to an impalpable powder, but that will not restore its adhesiveness, and on this depends its plastic property. The complete removal of this water of hydration is the condition on which the durability of all clay work depends. The loss of this water is the measure of the shrinkage observed in settling of a kiln when it is sufficiently burned. An expert burner measures the completeness and uniformity of his burn by the extent and evenness of this sinking, though he may not know why the surface sinks at all. The water held by the absorbent power of the clay is disposed of as soon as the temperature of the kiln reaches the boiling point, as is indicated by the watersmoke. As soon as this disappears, the uncombined water is gone, but the space it occupied remains and gives the brick its porous property. If the brick be now exposed to water, it will absorb what it lost as watersmoke, and will in time regain its plastic property and become clay again. But if the temperature be raised to a white heat it parts with its combined water and the size of the brick is correspondently reduced, though the spaces left by the former reduction remain and the brick may absorb as much water as it lost at that time, yet it will show no tendency to go back to the condition of clay. From these facts we may safely infer that the portions of water lost at the two periods of burning, stood in a different relation to the clay.

In the clay in common use for brick-making, terra cotta, pottery, etc., silica appears both in a state of chemical combination and as a mere mixed ingredient; and each plays an important part in the manufacture. A good brick clay should not have less than 60 per cent. of uncombined silica in its composition. If the sand in combination is very fine and the proportion less than 60 per cent. the brick will be subject to loss by cracking in drying. If the sand be coarse and the proportion exceed 70 per cent. the bricks may mould and burn well, but they will lack strength. The presence of lime or magnesia to the extent of 8 or 10 per cent. with a high per cent. of fine sand will require great care to prevent the loss of the arches by vitrification. Iron is nearly always present in brick clay, and on its presence depends the now fashionable color of brick and terra cotta work, but if the iron exceed six per cent. a very high heat may spoil the color by making it too dark. A clean coarse sand and a low per cent. of lime, while it may not mould very smooth, will endure a very high temperature without losing its shape, will be very hard and well adapted to paving purposes. But the physical condition of a clay must always be carefully examined in selecting material for clay work of any description. While clay is never crystalline in its structure, it is frequently granular and coarse in its particles. Such clays should never be worked without being thoroughly crushed, or well tempered in a good pug mill. The Chinese wash all the material for their fine ware and use only that which is last precipitated, which consists of the very finest particles. We can hardly afford to adopt that process, but we have clays which have been naturally washed and are already fine and free from granulations. In many places along our larger streams, low lands are flooded with backwater, in times of freshets, from which beds of finely washed clay have accumulated. The draining of our marshes have revealed beds of washed clay below the surface muck. This variety of clay, generally has a light blue or lead color, and on this account is frequently rejected by clay-workers, fearing a deficiency of iron to give the proper color. But this is seldom the case, as the iron, being combined with sulphur, is the cause of the color they distrust, and burning liberates the sulphur and restores the iron to the form of a per-oxide.

But perhaps the most singular, as it is the most valuable property of a pure clay is its complete neutrality. All its affinities are perfectly neutralized, and consequently it is removed from the liability to be decomposed by any extraneous agent. This insures, when perfectly burned, its permanent and perpetual durability, except when destroyed by some crushing force.

The Star Fire Brick Co., Pittsburgh, Pa., received an order for 25,000 fire brick to be used in the construction of a charcoal plant furnace at Durango, Mexico, to be erected by the Mexican Iron Mountain Manufacturing Company. The brick will have to be transported 100 miles in wagons, as there is no railroad nearer than that. It is said that the cost of delivering the brick will be $250 a thousand.

Written for the Clay-Worker.

HINTS ON BRICKMAKING.

No. 34.

BY "R. BRICK."

After a number of years experience it is my opinion that the two great points in the business of brickmaking are, first, turn out the full capacity of your machinery every day; second, get this product into the market with the least possible waste, after the bricks leave the machine.

The waste in drying, burning and handling, should not exceed one per cent. To meet the first point it is necessary to keep the machine running continuously, for this is the fountain that supplies the stream of bricks; if this be stopped the stream is broken. If on the other hand you can keep the machine running, the supply will come without a break; if one hour is lost at the machine it cannot be regained. If the setting gets behind extra help will make it up; so with loading from the kiln. Therefore, don't let any small matter or a little unusual expense stop the machine. It may be necessary sometimes to put on one or even two extra hands to keep it running. It is better to do this. It is false economy to stop a machine to save a little extra cost. It is true economy to have enough men at the machine to do the work well. To get all out of a machine there is in it, it must be kept full of clay. Again there must be enough force to take away every brick that is made, and do this without injuring or destroying any of the bricks by hasty handling. Sometimes there are but two truckers when there should be three, and in the course of a day two thousand bricks are thrown back—all this loss to save one dollar.

It is necessary to have a few days supply of clay under sheds, so that rain will not interfere. It is also necessary to have an extra machine to insure a steady output; the saving of lost time in one season will pay for a machine.

We will suppose the weekly production of a works is 150,000 bricks, one week's expenses $450.00 or three dollars per M., we will say labor costs $1.25 per M., fuel cost $1.25 per M., and regular or current expense, 50 cents per M. The latter includes salary of superintendent and book-keeper, other office expenses, horse feed, insurance, taxes, etc. When this works produces 100,000 in a week, labor costs $125.00, fuel $125.00, and regular expenses are $75.00, or, a total of $325.00 per 100,000 bricks, or, 25 cents per thousand more than the previous week.

Next comes the point of saving the product after it is made. First they must be properly handled, then they must be dried under cover, to avoid loss by rains, and dried in a manner to suit the quality of the clay, so as to prevent loss by breakage. In drying, to make the output regular throughout the year, it is necessary to have artificial dryers.

After they are dried they must be properly burned, that is the important point, burn them well. Next, with the least cost for fuel and labor. As large a per cent. of the whole as possible should be hard without damaging or destroying any by overburning. To do this it is necessary to have permanent walls, and to prevent damage and loss in the arches from sudden changes of temperature there must, in up-draft kilns be furnaces and heat chambers interposed between the cold air and the burning bricks. In down-draft kilns the air is heated as it passes upward between the outer and inner walls. A kiln, first, must burn the bricks nearly all hard without waste, and with cheap fuel. It must be simple to operate and control. Another point, it must be durable, or its advantages will be overcome by the cost of keeping it in repair. If any brickmaker will turn out his full capacity every day and save it as described in the foregoing, he can make money in the brick business; without these points being attended to he cannot succeed.

The profits per thousand are too meagre to bear much theory or red tape. Theory has ruined many a brick yard. It takes a rich firm to stand up under the management of a man who has many theories to explode and little practical knowledge. It is well to be progressive but not well to sink all the profits in experiments and changing the order of things frequently. Get the appliances suited to your clay, location and capacity, and stick to them. Get the best there is in them and push your business. If you are not a practical brickmaker secure the services of one who is, and learn the business. Never let a customer wait for bricks. If it is necessary, load bricks all night; load them in the rain. Get up a reputation for promptness in filling orders and your sales will increase. Give a man good bricks, and ten hundred for a thousand, every time. Talk your business up, explain the advantages of brick over wood for building, its fire proof qualities, its durability, etc. Advertise your wares so that people may know where they can get bricks. Have posters printed with name, address, and what you manufacture, and paste one on each side of every car of brick that leaves your works, and attend the annual meeting of the National Association of Brick Manufacturers and get all the new and valuable points of your business.

THE TILE'S BOAST.

[Read before the Iowa Tile and Drainage Association by T. E. Haines, President of the Association].

I am only a tile but in this age of light,
Full freedom of speech I will claim as a right,
I am moulded by man and hardened with fire
With clay for my parents both mother and sire.

My family record is old as the mountains,
They have written my name in beautiful fountains,
But the credit that's due me has not been bestowed
For I work on the farm as well as on the road

For the first time in my life I will boast of my worth,
Though humble, retired and lowly of birth
In praise of my work future ages will sing
Nor would I uncover my head to a king.

In seasons when floods of water prevail
My usefulness was never known to fail,
I work all the night and am busy by day
In carrying the surplus of water away.

When I venture to settle on low land or boggs,
My foes are the crawfish, the tadpole and the frogs;
But so soon as they find that the water is gone
They pick up their traps and seek a new home.

Sometimes I have spent the whole night on a tare,
In moonshine and darkness, foul weather and fair,
But like the obedient son or the daughter,
I never drink anything stronger than water.

I've a friend, the farmer, kind hearted and true,
I've gained all this friendship by draining his slough;
And then to complete the joy of his life,
I carried the water to please his good wife.

I am hard as a rock, and will never decay,
The storm that sweeps over can't blow me away;
Thus when I am planted down deep in the drain,
I'm a permanent fixture and always remain.

My work in improving the general health,
And also the farmers' material wealth
In every land has given me a name
That is covered with honor and glory and fame.

The philosopher's trouble is that while he can give fifty years to evaluating life impartially, life has spent several thousand years in shaping his prejudices.

Written for the Clay-Worker.

POTTERY.

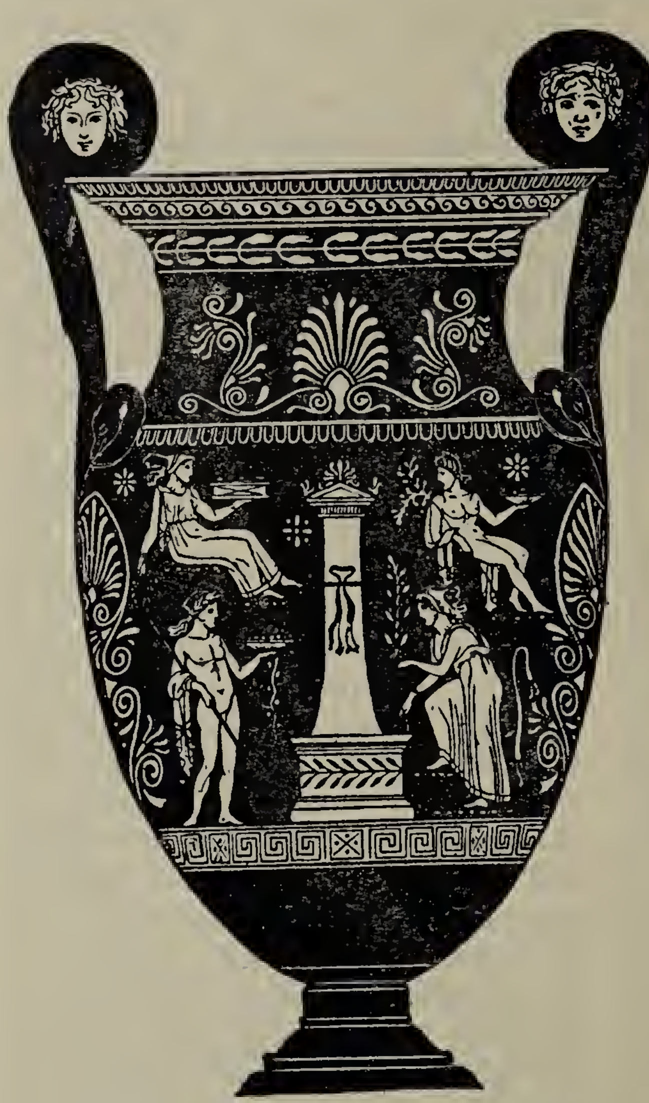
No. 2.

It is curious how the classical forms of vases, drinking vessels and amphora have predominated over all others suggested by the ingenuity of the artists of many ages and races. The modern renaissance of the ancient models in pottery has more foundation than mere historical enthusiasm—the forms themselves have an artistic simplicity of decoration and a beauty of outline that have not been surpassed; and where departed from have led to a florid ornamentation that destroyed the simplicity, and the adoption of forms that have bordered upon the positively ugly.

It is even more curious as we find the germs of these classical forms far backward in the twilight of the human race. The Trojan forms we displayed last month are reproduced in Central Africa, Yucatan, Peru, and in Europe. Hogarth's line of beauty, the ogee curve, seems to have a universal birth place. But so has the gourd, the immediate predecessor of the earthenware vessel, and it is probable that more of the early forms were borrowed from that useful vegetable than were produced through an innate perception of the beautiful. The gourd-shaped and the cup or urn-shaped vase have been universally followed by all Runic people, and differ but little from the banks of the Euphrates, forty centuries since, to the back villages of Scotland at the beginning of the present century.

No. 1—*Egyptian Water Jar.*

A certain rudeness of outline and finish is perceptible on all hand-made pottery. The conception of the forms were artistic, but they could not be executed, and it is only among those people who became acquainted with the potter's wheel that we begin to find natural beauty of form united with sufficient delicacy in structure to give it an elegant effect. Indeed, the art of pottery as an art, was not quite possible without this means to give it expression.

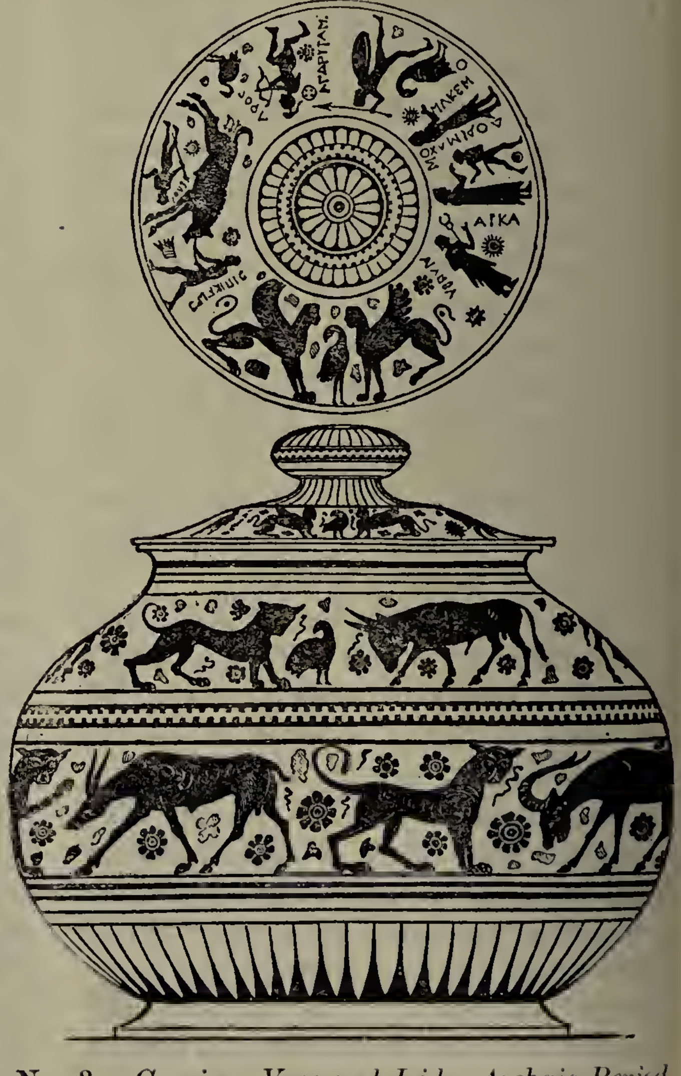


No. 2.—*Grecian Vase—Archaic Period.*

The earlier efforts in pottery were of form merely. Decoration was confined to simple lines, zigzag or wavy lines, and uncouth representations of birds, animals and human figures. With more delicate forms, these were seen to be incongruous,—in fact the same artistic perception that realized the elegant outline at once procured a more elegant and lifelike decoration. The owl-headed Minerva—a symbol of wisdom, was transformed into the stately and ubiquitous Athenae—an incarnation that even yet affects the beholder with consciousness of superior mental power. The stiff draperies, as if made of sheet iron, began to fall naturally over the figures. Mere skeletons were clothed with rounded muscles, and all the forms of life were imitated as nature made them.

In the last issue we presented some examples of the early crudities. In this issue we give a few forms into which the crudity immediately melted. It is termed Archaic Greek, in which delicate forms are decorated with excellent conceptions, but in a stiff and conventional method. However, the improvement is prodigious, and but little more is needed to achieve the highest ideal of art expression—imitation of nature in her moods—free flowing, passionate, or placid.

An exception must be made, however. The Chinese, a modern people, are a remnant of the ancient world, and besides, their art grew up beyond the influence of Greek culture, that seems to have engulfed all other civilizations, ancient and modern. The example given is exquisite both in form and decoration, and the structure of the ware, as all know, is yet in advance of the best modern effort. Her decorative art is ungainly in conception, but superb in execution. Impossible dragons and genii innumerable disport in life-like and flowing attitudes, as if to attest their vitality; beautiful flowers and shrubs, of exquisite color and perfect shape, grow as if each were a world to itself. The grouping of figures the Chinese never understood. Their genius is



No. 3.—*Grecian Vase and Lid—Archaic Period.*

detail, gorgeous coloring and prinstaking finish.

The Greek forms and decorations were imitated throughout the entire Mediterranean circuit. Greek colonies in Italy carried their art with them, and it slowly extended westward through Etruria and the Islands. Generally the art suffered in the new hands. The Etruscans, especially, while they preserved the Greek purity of outline, degraded the decoration.

At this period those master clay workers, the Chaldeans had began to merge into a barbarous remnant, and the great city of bricks was crumbling into ruins. But their art had proceeded to the shores of the Bosphorous, and into Persia. The Ionian, or Asiatic Greeks had early seized upon and improved the Babylonic art, by substituting life-like forms for the decoration of wares, instead of the emblematic but uncouth winged bulls and hieroglyphics. The Greek heroic age supplied its gods and goddesses from whom the likeness of man was presumed to be borrowed. They represented human passions, acting in a human way, and the effects are as strong to-day as human nature is enduring—as well understood now as in the days of Themistocles, a condition that accounts for the extreme vitality of Greek art and culture.

No. 4.—*Japanese Vase—Ancient Type.*

A Mississippi woman fell into a mill pond, and when she was rescued a ten-pound catfish was entangled in her wire bustle. Her husband wanted to set her again, but she would not consent.

Written for the Clay-Worker.

TESTING BRICK.

BY IRA O. BAKER, PROFESSOR OF CIVIL ENGINEERING, UNIVERSITY OF ILLINOIS, CHAMPAIGN, ILLINIOIS.

Thinking that the results of testing the same class of brick in all the ways usually employed for such tests and of testing the several classes of brick under identical conditions, might be interesting and perhaps instructive, the writer undertook the experiments reported below. Incidentally he explains why different experiments obtain such diverse results, and gives data whereby results obtained under different conditions may be compared.

Table I. gives the result of experiments made by the author on brick from selected manufacturers in Illinois. A few general explanations accompany the table, and a detailed discussion of the manner of making the several tests will be found below:

TABLE I.—TESTS OF ILLINOIS BRICK.

Reference No.	Kind of Brick. Condition of Clay.	Method of Moulding.	Locality.	Trade Name.	Proportion of Kiln represented by the Brick Tested.	Absorption. Air-dried 3 weeks, immersed 42 hours and air-dried 4 hours.	Transv'se Strength. Modulus of Rupture, pounds per square inch.	Compressive Strength. Average Dimensions of bed-area, inches.	Condition of Pressed Surface.	Observed Crushing Strength, pounds per square inch.
1	·	Hand.	X	Soft.	15 per cent.	21.6 per cent.	143	....	Not Plastered.	674
2	"	"	"	Face.	10 " "	19.2 " "	....	4x4¼	" "	1,585
3	"	"	"	Paving.	50 " "	5.8 " "	1,266	2½x3½	Plastered.	11,340
4	"	"	"	Arch.	25 " "	....	1,057	....	....	....
5	"	"	Z	Best.	....	2.5 " "	2,204	....	....	....
6	"	"	"	Hard.	....	1.1 " "	1,317	....	....	....
7	"	"	"	Paving.	60 " "	4.8 " "	1 429	2½x4	Plastered.	6,190
8	"	"	"	"	60 " "	5.8 " "	1,117	2½x2½	"	4,360
9	"	Machine	Y	Face.	20 " "	9.0 " "	963	3½x3¾	Not Plastered.	4,911
10	"	"	"	Paving.	50 " "	4.5 " "	1,712	2x2½	Plastered.	13,085‡
11	"	"	"	Arch.	20 " "	3.3 " "	851	....	....	....
12	Stiff.	"	X	Paving.	50 " "	6.3 " "	996	3x3¼	Not Plastered.†	8,486
13	Dry.	"	Y	Face.	....	10.7 " "	260	3¾x4	" "	2,719
14	"	"	Q	"	....	15.0 " "	413	3¾x4⅛	" "	3,573
15	"	"	"	"	....	2.2 " "	3,217	....	....	See note below.

‡ Not Plastered, 6,190. See further remarks in subsequent discussion. † But the beds were quite flat.

EXPLANATIONS.—Identically the same brick were tested for absorbing power, transverse and crushing strengths. Each result represents the mean of three to fifteen experiments—the results for crushing strength are the mean of three, and the others the mean of seven to ten. The tests were made with the 100,000 pound testing machine belonging to the University of Illinois.

Nos. 3 and 10. Brick from the some makers as these are giving entire satisfaction in pavements.

Nos. 7 and 8. These bricks were taken out of a pavement, where they had shown great durability, for these experiments.

No. 13. These bricks were removed from the face of a building, where they had given fairly good satisfaction for sixteen years.

No. 15 is a new brick, recently put on the market, for which a crushing strength of 30,000 to 35,000 pounds per square inch is claimed. The writer tested a single brick on *end* up to 11,300 pounds per square inch, without developing any of the cracks or snapping sounds which always precede the failure of brick or stone in crushing tests. Such signs usually (but not always) appear at about half of the ultimate strength. The writer is having some specimens made to test this subject further. This brick is a striking illustration of the possibilities of brick manufacture. Brick is composed mostly of clay, which is largely alumina—one of the strongest of metals—and why should not a brick approximate to the qualities of a metal?

ABSORBING POWER.

The absorbtive power of brick is one of the most important elements, since it greatly effects the durability of the brick, particularly its resistance to the effect of frost. The less the amount of water absorbed the greater, in all probability, will be its durability.

Different methods are in use for determining the amount of water taken up by a brick, which lead to slightly different results. Some experimenters dry the brick in a hot-air chamber, while others dry them simply by exposing them in a dry-room; again some experimenters immerse the brick in water in the open air, while others immerse them under the receiver of an air-pump; and, again, some dry the surface with bibulous paper, while others allow the surface to dry by evaporation.

The absorbing power given in Table I. was determined by (1) drying the brick in a steam-heated room for three weeks, (2) weighing, and (3) immersing them in water for 44 hours; and then (4) drying for three hours, or until all the water on the surface was evaporated, and finally (5) again weighing them. The results in the table represent the mean of several observations. If the brick had been kiln-dried, or weighed before the surface water was entirely removed, the apparent absorption would have been greater.

Brick can be selected which will absorb from 25 to 33 per cent. of their weight of water; weak light red ones, such as are frequently used in filling in the interior of walls, will absorb about 20 to 25 per cent.; while the best brick will absorb only 4 or 5 per cent. A brick may be called good which will absorb not more than 10 per cent.

The absorbing power of the best brick is about equal to that of average limestone and sandstone, and about equal to that of the poorest quality of granite and marble, and the absorptive power of average brick is about twice that of average mortar. The absorptive power of stone, brick and mortar is about as in Table II. The entry "1—150" in the table indicates that "Granite will absorb one one hundred and fiftieth of its weight of water.

TABLE II.—ABSORPTIVE POWER OF STONE, BRICK AND MORTAR.

KIND OF MATERIAL.	Ratio of Absorption.		
	Max.	Min.	Average.
Granites	1—150	0	1—750
Marbles	1—150	0	1—300
Limestones	1— 20	1—500	1— 38
Sandstones	1— 15	1—240	1— 24
Brick	1— 4	1— 50	1— 10
Mortar	1— 2	1— 10	1— 4

TRANSVERSE STRENGTH.

Owing to both the nature of the quality tested and the facility with which such a test can be made, the determination of the transverse strength is one of the best means of judging of the quality of a brick. The transverse strength depends mainly upon the toughness of the brick, a quality of first importance in bricks used for paving, and also a quality greatly effecting the resistance to frost.

The transverse strength is determined by supporting a brick on two knife edges, and applying a pressure through another knife edge placed above and half-way between the other two. The modulus of rupture, the term universally employed to express transverse strength, is then computed by the following formula:

$$R = \frac{3\,l\,w}{2\,b\,d^2}$$

in which R represents the modulus of rupture, in pounds per square inch; *l* represents the distance, in inches, between the two lower knife edges; *w* represents the load applied, in pounds; *b* represents the breadth of the brick, in inches; and *d* represents the thickness of the brick, in inches.

Table I. shows the results obtained for the different varieties of brick. This data is summarized, for the best quality of each class of brick, in Table III.

TABLE III.—TRANSVERSE STRENGTH OF ILLINOIS BRICK.
(Summarized from Table I.)

Reference No.	KIND OF BRICK.	Modulus of Rupture in lbs. per square inch.		
		Max.	Min.	Average.
1	Soft clay, hand-moulded—best, 50 per cent. in kiln.	2,233	846	1,409
2	" " machine " " " "	2,354	1,135	1,712
3	Stiff clay " " " "	1,475	764	1,114
3	Dry clay (pressed)	495	150	336
5	Secret process	4,348	2,235	3,217

The above results are considerably larger than those obtained by other experimenters. The bricks used in experiments were obtained from manufacturers well known for the high quality of their products. The following results were obtained under the direction of the chief engineer of the Lehigh Valley R. R. Each result represents the mean of seven to nine experiments on bricks from different localities. Nothing is known concerning the quality of the brick farther than as given in the table.

TABLE IV.—TRANSVERSE STRENGTH OF EASTERN BRICK.

DESIGNATION OF BRICK.	Modulus of Rupture.		
	Max.	Min.	Average.
Very Hard	1,796	1,045	1,352
Hard	944	710	805
Medium	645	504	597
Soft	444	269	373

For the sake of comparisons between the transverse strength of brick and stone Table V. is given.

CRUSHING STRENGTH.

Curiously enough the crushing strength is generally regarded as one of (*a*) the most important requisites for a good brick, while in fact it is at once (*b*) the least important, and (*c*) the most difficult to obtain. *a.* A high crushing strength is regarded as important because brick are frequently employed in situations where they support a heavy load; and yet the crushing strength of the weakest brick in Table I. is 674 pounds per square inch, (nearly 50 tons per square foot) which is equivalent to the dead weight of a pile of brick 960 feet high. *b.* Tests of the crushing strength of individual brick are useful only in comparing different kinds of brick, and give no idea of the strength of walls built of such brick, since the strength of brickwork is far more dependent upon the quality of the mortar than upon the strength of the brick. Even under the most favorable circumstances, doubling the strength of the brick produces a hardly perceptible effect upon the strength of the masonry constructed of such brick. *c.* The results of tests of the crushing strength of brick give no difinite indication of the strength of the brick unless the manner of making the tests are clearly comprehended, since the crushing strength varies greatly with the details of the experiments.

TABLE V.—TRANSVERSE STRENGTH OF STONE.

KIND OF STONE.	Modulus of Rupture.		
	Max.	Min.	Average.
Bluestone Flagging	4,511	360	2,700
Granite	2,700	900	1,800
Limestone	2,500	140	1,500
Marble	2,880	144	2,160
Sandstone	2,340	576	1,260
Slate	9.000	1,800	5,400

The manner in which experiments on the crushing strength of brick may vary and the effect of such variation upon the results obtained only will be considered at this time.

In testing stone, the uniform practice is to test cubes whose faces are dressed to parallel planes. In testing brick there is no settled custom. (1) Some experimenters test half-bricks, while others test whole ones; (2) some grind the pressed surfaces accurately to planes, and some level up the surface by putting on a thin coat of plaster of Paris, while others leave them in the rough; and (3) some test the brick set on end, others on the side and some flatwise.

1. With a view to determine the relative strength of a quarter, a half, three-quarters and a whole brick, the writer tested a number of specially-selected brick, of a brand (No. 14, Table I.) remarkable for regularity of size, uniformity of texture, and evenness of burning.

Every precaution was taken to eliminate all sources of error, but the description of these precautions would be too long to be given here. The average result for ten experiments on each size was that the strength per square inch of a quarter-brick is about 50 per cent. of that of a whole one, that the crushing strength per square inch of a half-brick is about 66 per cent. of that of a whole one, and that the crushing strength of three-quarters of a brick was about 85 per cent. of that of a whole one. Before these results can be relied upon as being absolutely correct, they should be tested for other qualities of brick, since those employed in these experiments were rather soft, also since slightly different results can be obtained by combining the results in different ways. However, the results are probably sufficiently accurate for use in comparing results for crushing strength obtained with different-sized specimens.

The reason why a whole brick should be stronger per square inch than a smaller piece is apparent if a whole brick be conceived as being made up of a number of cubes placed side by side, in which case it is clear that the interior cubes will be stronger than the exterior ones because of the side support derived from the latter. To illustrate the effect of this lateral support, the writer applied a pressure to a small part of the upper surface of various materials, and determined the force which was required to crush them. The pressure was applied through a circular die about 0.6 inch in diameter. When the die was in the center of the broadest face of half-a-brick the crushing strength per square inch was from three to eight times the amount which would crush the brick when the pressure was applied uniformly over the entire upper surface. The relative strength under the two methods varied with the thickness of the specimen, and with the distance from the edge to the die. With a block of limestone 7 inches thick and the die 4 inches from the edge, the strength per square inch of the area under pressure was 25 times the crushing strengh of the same material when the pressure was applied uniformly over the upper surface. This increase of strength was due to the lateral support derived from the material not under pressure. The quarter-brick and the half-brick have less of this lateral support than the whole one, and hence have a correspondingly less crushing strength.

2. The strength of the specimen will vary greatly with the degree of smoothness of its bed surfaces. To determine the difference between reducing the pressed surface to a plane and leaving them in the rough, the author selected six brick of regular form and apparently of the same strength, and tested three in the rough, and the other three after having reduced the pressed surfaces to planes by laying on a coating of plaster of Paris which, after drying, was ground off to a plane. The amount of plaster remaining on the surface was just sufficient to fill up the depressions. Both sets were tested in a hydraulic press between cast-iron, parallel (self-adjusting) pressing surfaces. The average strength of those that were plastered was 2.06 times the strength of those that were not plastered.

This difference will vary with the relative strength of the brick and plaster. The average strength of the bricks whose surfaces were plastered was 9,170 pounds per square inch, which is more than that of the plaster used; and, therefore, it is highly probable that if the surfaces had been reduced to planes by grinding, the difference in strength would have been still greater. A stone which uniformly gave a strength of between 5,000 and 6,000 pounds per square inch, when tested with plaster beds which had been allowed to attain their maximum strength, gave from 5 to 20 per cent. less strength than when the beds were carefully rubbed down to plane surfaces—the mean for ten trials was almost 10 per cent. less than the strength of the specimen having rubbed beds. Hence, if the pressed surface of the above brick had been rubbed down to a plane, the difference in strength with rubbed beds would probably have been about 2.26—instead of 2,06—times the strength with rough beds.

Formerly it was the custom to interpose a sheet of lead between the specimen and the pressing surface of the testing machine, "in order to distribute the pressure evenly." In crushing a material stronger than the lead, the latter is squeezed out sidewise from under the specimen, which action introduces lateral forces that split the specimen before it can fail by crushing. For even moderately strong stone, the strength with lead interposed above and below the specimen is only two-thirds of the strength when crushed between steel. This use of lead was the custom formerly, but is almost wholly abandoned now.

3. As before stated, some experimenters test brick flatwise, some edgewise, and some endwise. Since bricks are generally employed in such a position that the pressure is on the broadest face, it appears a little more satisfactory to lay the brick flatwise while testing it; but, since the only object in determining the crushing strength of brick is to compare the relative strength of different brick—the strength of the brick is only remotely connected with the crushing strength of the brick masonry—the position of the brick while being tested is not a matter of vital importance.

Doubtless the principal reason for testing them on end or edgewise is to bring them within the capacity of the testing machine. However, there is one good reason against testing brick flatwise, viz., all homogeneous granular bodies fail under compression by shearing along planes making about 45° with the pressed surfaces; and hence if the height is not sufficient to allow this shearing stresses to act freely, an abnormal strength is developed. For example, when a cube of reasonably homogeneous stone is subjected to a crushing force, it fails by the four vertical faces being forced off laterally. Each face carries with it a flat pyramid of which the vertical face is the base, and whose apex is at or near the center of the cube being tested; the remainder of the specimen then has the form of pyramids whose bases are the top and bottom faces of the cube and whose apexes meet at the center of the specimen. When a block of stone or brick, whose height is less than its length, is subject to a crushing force, the pyramids forced out at the side do not reach to the center of the specimens; and hence the interior portions are supported on the sides and consequently develop greater strength. This is, practically, only another explanation of why a whole brick sustains more per square inch than a half or quarter brick. (See item 2, above.)

The relative strength of brick tested in the three positions—flatwise, edgewise, and endwise—varies somewhat with the details of the experiments; but it is reasonably well settled that the strength flatwise between steel or cast iron pressing surfaces is from one and a half to two times as much when the brick is tested on end, and a few experiments by the author seem to indicate that the strength edgewise is a little more than a mean between the strength flatwise and endwise.

The latter part of Table I. shows the

result of experiments to determine the compressive strength of brick. The brick in Experiments Nos. 12, 13 and 14 were so smooth that the condition of surface could properly be described as "rubbed flat;" at least these brick should be considered as having been tested under as favorable conditions as those having "plastered" bed. No. 12 is a good example of the deception of a partial test. Although this brick shows a relative high crushing strength, a fairly good transverse strength, and a moderate absorption, yet it disintegrates rapidly under the action of frost in such a way as to show that it has a laminated structure and that the laminas are not well cemented. Although a critical examination of this brick with the unaided eye failed to detect such structure, compressing the brick sidewise and endwise never failed to reveal it. The strength given in the table is that when the pressure was applied to the edges of the laminæ. An important conclusion derived from such facts is that the manner of behavior during the test is often more valuable than the final result. The behavior of No. 15 during the test of absorbing power gave a hint that possibly this brick also has somewhat of a laminated structure. This last can only be settled by further experiments.

The foregoing discussion of the effect upon the results of variations in the manner of making tests for crushing strength shows how necessary it is in using such results to have a clear understanding of the method of making the experiments and also of the effect of a variation of that method. To simply say that a brick stood so many pounds per square inch gives no idea whatsoever of the quality of the brick.

PAVING BRICK.

BY J. J. W. BILLINGSLEY.

The best pavement for the money, is the question of the hour with the city authorities of many cities. This is especially true of the cities of rapid growth in what was known as the "Far West," a few years ago, but now the Middle States. The westward flow of population makes the investment of capital in the development of towns and cities so as to secure the most desirable share of this tide of immigration a very important question. How to provide city advantages so as not to burden unnecessarily with debt, and at the same time make the advantage so inviting as to secure the settlement of enterprising citizens, especially those who have capital to add to the wealth and importance of the city's growth, is a question of paramount importance.

Towns and cities take on a personality as much so as men. They are known for what they are, and not for what they might be. The wide-awake members of the City Council are always ready to support measures that look forward to the best development of the cities' interest. Chief among the questions that come up for consideration, and that will not down but keeps coming, is that of street improvement. There are several important points to be considered in the selection of a pavement. The cost of the pavement should not bankrupt the city, besides its durability in proportion to the cost should, by all means, invite its construction.

The most durable pavement in proportion to the cost may not be desirable on account of the character of the surface to be traveled. Cobble stones, for instance, may be so laid as to last a great while, and yet as a travelway the street may be avoided, or if the travel is compelled to pass over such a street, it is done at a slow pace and great discomfort to men and horses,—the vehicles are racked and wrenched, and the horses lamed. Streets having a smooth, solid surface, but sufficiently springy to admit of the more rapid transportation with less damage to both men and horses, are in every way most desirable. A little additional cost should not stand in the way of constructing a durable and desirable pavement. By the word desirable we mean a street that will draw travel on account of the character of the surface to be traveled. Wooden block pavements offer a smooth and springy surface for three or four years; after that time it will require more or less in the way of repairs, and at the end of eight or ten years they have to be replaced altogether. They are costly pavements, and not durable.

KINDS OF PAVING.

Block stone pavements are costly and durable, but rough, always rough, hard on vehicles, horses and those that use them. Asphaltum pavement is costly, smooth and springy for a few years. The surface wears rapidly, and soon becomes uneven and not easily repaired. At Washington City, where there is probably more of this pavement in use than in any other city in the United States, the writer only last May examined several streets paved with asphaltum that were fast wearing away. While it is a very pleasant pavement to travel over, yet the cost and want of durability make it objectionable to some extent at least.

AS TO BRICK.

In the past two years the use of brick to pave streets has been receiving considable attention.

Sixteen years ago, Charleston, West Virginia, had one street paved with brick. The street has been subject to a constant, heavy travel with little, if any, repair worth naming, and we are informed that the pavement is in good condition. After several years of trial the city is improving their streets by paving with brick. At New Cumberland, West Virginia, they speak very highly of brick-paved streets. At Stubenville, Ohio, the writer examined a street that had been paved eight years, and was surprised to find the pavement in most perfect repair, and the surface so smooth as to hardly indicate that it had been traveled for more than a year. We have, however, examples of the utility of brick paving nearer home. Fourteen years ago the writer witnessed in part the laying of one square of brick paving on the principal traveled street in Bloomington, Illinois, being on the west side of the court house square. The pavement was laid by Mr. Heafer, a well-known brickmaker of that city. Since the laying of it the writer has occasionally visited that city, and at no time have we failed to examine the wear of the pavement. It has more than met expectations, and the city to-day has, we are informed, several miles of streets paved with brick.

Decatur, Illinois, commenced to use brick for paving their streets four or five years ago, and their use has met with such favor that they have put down several miles of brick pavement. At Galesburg, Champaign, Peoria, Lincoln, Springfield and Danville, and other towns and cities in Illinois, there are many, many miles of brick pavement. In Ohio brick are coming into general favor for street paving. The greatest hindrance to the general introduction of brick for paving has been the opposition of a few engineers, until quite recently. In my own city we have not tried brick for the reason that our City Engineer will not investigate the merits of such a pavement. He is a kingly fellow that knows all there is to be known in his profession and entertains the opinion that when he

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*Read before the Iowa and Ohio Tile and Dainage Associations.

says no that that ought to settle the question for evermore. In presenting the matter to him on one occasion, he took up a common brick and a two-pound hammer, and striking the edge knocked off a piece of the brick, saying, "Dont you see it won't do?" But we said to him, "If you take a stone with a sharp corner and give it a like stroke the same result would be experienced." Brick pavements are not a new thing under the sun, to be classed alongside with some of Edison's discoveries. In the Netherlands and Holland the highways are paved with brick. A traveler may drive for days without encountering a dirt road, except occasionally, some of the roads have been paved more than a century. They are easily kept in repair, inexpensive after being constructed, and are splendid travel ways. When properly constructed they are smooth, springy and durable. "Hard as a brick" is a common saying, and there are hard bricks, and brick ought to be hard for this purpose, and if well laid they form a most desirable travel way.

QUALITY OF THE BRICK.

The success of brick pavements will depend very largely upon the character of the material used and the construction. Brick may be hard—approaching a flinty hardness, and yet not suitable for a brick pavement, for the reason that they are easily broken. There is a marked difference in the character of the clay from which the brick are made. Some clays will make a hard, tough brick—not easily chipped or marred in any way; and such brick should be used in pavements. Mistakes will be made as to the character of the brick that are used until those having the work in charge learn as to the character of the material that should be used to secure the most desirable pavement. Those having the work in charge, and who are supposed to stand between those who pay the bills and those that do the work, should keep a sharp look out that no material is used unless fully up to the required standard of excellence. The taking of two brick and knocking them together until their character as to hardness or toughness is pretty fully determined, is a way of testing that does not often fail to discover defects if they have any.

Again we would emphasize the necessity of using all hard brick—that is, every brick should be hard. We believe, from years of observation and investigation, that clays of desirable character may be found conveniently near to make pavers for almost any locality, after the brickmaker has learned how it should be managed. There is no danger of any monopoly of the business, or scarcity of material to be anticipated. If every street and highway in this state had to be paved, there would be no lack of material, if they were all made as broad as the "Appian Way."

In a paper read before the late meeting of the National Brick Manufacturers' Association the writer made the following summary of reasons as to the desirableness of brick pavements, which we repeat here for the reason that we have as yet seen no cause for making any change in the claims then made, which were as follows:

1. Brick make a smooth pavement, over which a heavy load may be drawn without a jolt. Draft horses can easily draw a third larger load at greater speed than they can over a bouldered or rough stone pavement. In addition, both team and wagon are subjected to less wear and strain. For light vehicles, there is a most striking comparison. It is a pleasure to sweep along without a jolt or a jar, whereas over cobble-stones it would be a test of strength to the team and carriage, and a tribulation to those that travel them.

2. Brick pavements are desirable because of their durability. The instances before referred to sufficiently attest this claim.

3. The abundance of the material at command and comparatively without cost.

4. The pavements are easily repaired, No other pavement can claim so much in this respect. If a brick proves to be imperfect, replace it with another and the work is done.

5. Brick pavements are less expensive than other pavements, if durability, wear and tear of teams, vehicles, and comfort, are taken into account.

CONSTRUCTION.

First the road-bed should be crowned a little, and well underdrained so as to fully insure a solid and dry foundation, which may be the cheapest and at the same time the most efficient way to secure this is by laying two lines of drain tile, two or more feet inside of the outside line of the pavement on each side.

After the necessary grading, add three or four inches of sand, then a layer of brick laid flat, then an inch or more of sand, followed with a layer of brick set on edge, and the spaces filled by spreading an inch or more of coating sand on the brick, allowing travel to wear it into the spaces between the bricks. Another and a cheaper method is a very perfect grade rolled with a heavy roller coated with three or four inches of sand. Set brick on edge and settle with heavy tamps, and then coat the top with sand as before.

Where sand cannot be had in sufficient quantites the bed for the brick may be made smooth, even, and soft, or pulverized to a depth of two or three inches on the surface—the brick set on edge and settled with tamps, and the cracks or crevices between the brick filled with pulverized earth. Another method is to make the grade desired cover with a slight layer of sand cover sand with boards. Spread an inch or more layer of sand, then set brick on edge and spread sand over surface as before.

In conclusion, is it too much to anticipate that in no very distant future we shall see not only the streets of our towns and cities paved with brick, but also our highways. A pavement 25 feet wide would suffice for public roads. Roads are said to indicate the degree of civilization attained by those who people a country. Have we not attained a degree sufficiently advanced to warrant the prediction of brick-paved highways? The need is imperative, the material abundant. and the enterprise not wanting in a few. With a little education in this direction the way seems fully open. With tile-drained farms, yielding maximum crops, and paved highways that may be traveled at any season of the year, over which may be transported to market the immense surplus, will mark a period in our history never before witnessed in the advanced civilization of our people.

Why Fires Burn Brightly in Winter.

There are several reasons why a fire burns so brightly in frosty weather. First, the air being cold is denser, and the heated air and gases from the fire are comparatively more buoyant. Consequently there is a greater draught. Then the air, being denser, contains more oxygen in an equal volume, and that gas being quickly supplied, the combustion is fiercer and more perfect. In frosty weather, too, the atmosphere is comparatively free from moisture, which of course has a tendency to damp a fire. For the same reasons fire generally burns more briskly at night, than in the day.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED BUT WILL NOT BE PUSLISHED EXCEPT WHEN PERMISSION IS GIVEN SY CORRESPONDENT. THOSE DESIRING TO COMMUNIACTE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

The Village Brickyard.

Editor Clay-Worker:

To a mind trained by long practice to observe cause and effect the village yard offers many interesting and not unprofitable problems. How many of us in the hurly burly of a busy life stop to consider and use the simple tools that lay near at hand. All of us a hundred times have wondered how hot our kilns in burning brick become, but as pyrometers are both scarce and difficult to apply, our knowledge in that direction is quite limited.

It occurred to the writer several years ago that a general idea of what was going on in that same hot kiln could be approximated by the use of various metals placed in the several parts of the kiln, and for the purpose of comparison the following melting points from the best scientific authorities at hand are noted:

Tin	melts at (Silliman)	442°
Lead	" " "	612°
Zinc	" " "	773°
Silver	" " "	1873°
Gold	" " "	2016°
Cast-iron	" " "	2786°
Copper	" " (Nystronis)	2160°
Brass	" " "	1900°
Common fire (wood)	"	1100°
Brick kiln,	Clay-Worker, Sept. 1887.	2000–2700°

All the above Fahrenheit's thermometer.

In September, 1887, a selection of commercial metals readily obtainable by every one was made, and they were placed in four brick and fired in our usual manner 88 hours, the kiln having a settle of 9½ inches, and being slightly stuck in the arches with a first-class top,

Brick No. 1.—Set in face of arch 8th course from bottom, and burned black ⅛-inch deep, nearly all over, and contained the following:

Zinc, fluxed with sand and surrounding clay, and colored sides of hole ¼-inch with dull yellow, similar to yellow crockery—no metal remained in the hole.

Tin, united with sand only, and left a fragile core of white ash—no metal remained in the hole.

Lead, fluxed to a brownish-black glaze, and run out of the hole, dripping on the brick below—no metal remained in the hole.

Brass, fluxed with sand and surrounding clay, and colored the same ⅜-inch deep with dull gray, about the shade of cast-iron—no metal remained in the hole.

Copper, oxydated, and about half the metal dissipated, the balance left with corners rounded, and of a dull black outside, but solid as before firing, when cut with a file.

Brick No. 2, Set in rounding between arches and burned hard as a good paver, 13th course from bottom.

Zinc, Same as in No. 1.

Tin, Same as in No. 1.

Lead, Same as in No. 1, except it remained in hole and formed a mass of black glaze, with sort of lead-colored core of same texture.

Brass, Same as in No. 1.

Copper, Same as in No. 1, except the remaining metal was enclosed in a nodule formed of the oxydation, the original metal having a brilliant film or coat of dark-red.

Cast Iron, oxydated, corners rounded, clay burned fast to oxydation, particularly to those parts of the iron that had been recently broken—probably lost onetenth of its weight.

Brick No. 3, Set in 21st course, and burned extra dark-red.

Zinc, Same as 1 and 2.

Tin, Same as 1 and 2.

Lead, Same as 1 and 2.

Brass, Dissipated same as 1 and 2, without residue but exact impress of original metal remains in the plug.

Copper, Similar to No. 2, except no nodule formed, coloring of original metal a more brilliant red.

Cast Iron, Same as in No. 2, but did not lose so much weight, say one-twentieth off, oxidation has appearance of blue-black velvet, clay burned fast to fresh fracture only.

Brick No. 4, Set 35 high (kiln only 36) was well-burned hard salmon.

Zinc, Burned to a white ash, but shows the original shape of the metal.

Tin, Formed a firm core with the sand.

Lead, Fluxed to a brown, otherwise same as Nos. 1, 2 and 3.

Brass, Metal in original shape, but fragile from oxidation, and very slight metallic lustre.

Copper, Slight nodule surrounding but retained every mark of the cutting tool. No brilliant color.

Cast Iron, Very little oxidation, free of clay except at one freshly-broken end. Same form as when fired.

The above samples were burned six in each brick by boring holes in the brick, dropping the raw metal in each hole and plugging each hole firmly with clay and sand.

The result of this experiment shows that zinc, tin and lead have no value for determining the heat of a brick kiln in any part, as they are either driven off in vapor, or combine with the surrounding clay into new forms.

It also shows that no part of our warmest kiln will melt cast-iron or reach 2786 degrees, or we should find the raw castiron recast in the hole or driven off by the long-continued firing.

This, then, leaves us only the copper and brass as an index of our heat. The brass, of course, will vary much, because rarely uniform, running from 1800° to 1900° and the copper, according to seven authorities at hand, varying from 1996° to 2192°.

Here, then, with these two metals, our total variation, according to the authorities accessible, is from 1800° to 2192°. Now let us look at our samples in brick No. 1, in the hottest part of our kiln, and we find the brass all gone, hence over the minimum heat of 1800°, and we find only half our copper gone, showing that we have not reached its melting point of say 2192°, for if we had reached this heat our copper would either be recast after being in a fluid condition, or driven off while in that condition. Our other samples show by reference to the same metals considerable less effect from the fire.

During the year 1888 these experiments were repeated with brass, copper and cast-iron, with similar results to above-named, and at the same time copper, silver and nickel coins were included, being set in the 7th, 15th and 27th course in a kiln set 36 high. All the coins but two in the 27th course, out of a total of twelve, were entirely destroyed. As none of them are a single metal, but a mixture of two metals, of course their melting point follows the usual rule of being less than the average of both. Their great surface in proportion to weight no doubt also tended to their destruction.

It would be a card in favor of some of the improved kilns if the owners would give us the result of such a test that some of us old fogies with open-top Philadelphia kilns might make a comparison of what they really have to offer us. A Village Brickmaker.

Call Again, the Latch String Hangs Out.

Editor Clay-Worker:

It was my pleasure to visit your city about the 10th of January, and while there I called to see you twice, and found you out each time. Being one of your subscribers I had a great desire to form your acquaintance, and have a pleasant chat. I was on my way to visit Messrs. Penfield & Son's works, and was taking in the different cities of the West, especially the brick works. I found Messrs. Penfield & Son very agreeable gentlemen, and I felt as though I had known them all my life. I was shown through their immense machine and brick works, and was very much surprised at the extent of their works. Machines loaded on cars, some ready for shipment, and a great many in course of construction, besides crushers and pug mills. They were too busy to spend much time in showing me around. We have been using their machinery since 1880, and from our experience would not have any other. I have seen a great many different kinds of brick machinery, but I am satisfied with what we have. There are other machines here, but we get the cream of the business, from the fact that we make a better brick, and we give Penfield's machinery credit for it.

The brick business in this section is looking up, and the prospects are very bright for this season.

Wishing you much prosperity for your valuable Clay-Worker.

Geo. O. Berry,
Columbus, Ga.

On the Right Track.

Editor Clay-Worker:

Enclosed find one dollar, to pay one year's subscription for Clay-Worker. The Lancaster Brick Co. was incorporated last April; have 105 acres of good clay-land, situated on the line of the New York, Lake Erie & Western Railroad, about twelve miles from this city; have two Martin machines, with the pallet system. We are young in the business, and learn something new almost every day and are willing to learn more, and therefore find your journal very interesting and profitable reading. O. T. S.

BUFFALO, N. Y.

About Burning.

Editor Clay-Worker:

In reply to the article on "Burning Brick" in your December number.

I did not know that an experienced burner had just one way to burn. A practical burner generally has several ways. A burner must use good judgment. When burning, if he finds by making his fires some other way it would be to his advantage, he must do it.

The article says, "burning the heads of a kiln forms a chimney." That is not necessary if he changes his fires from one side to the other. He will have no chimneys in burning this way unless there is a choke somewhere.

By changing the heads a kiln can be burnt in shorter time and burn the heads out closer than by burning the center first.

It also states, "if the fires could be started way back in the arches." That can be done after the first thirty hours. When you set your arches put some large, heavy wood in the center, when it is nearly burnt up shove your fire from the mouth to center—keep no fire at the mouth, put the doors part way on, to suit the draft of the kiln. When you see the watersmoke coming from the center in good shape then draw your fire to the heads and you will find that it will work well. W. A. R.

Referred to Our Readers.

Editor ClayWorker:

Being a subscriber to your paper, and always reading its contents very carefully to seek information, I would like to ask some practical brickmaker through the Clay-Worker, what is the most desirable length to set the benches in burning in clamps, and whether brick set uniform throughout the kiln will burn as many hard as to have, say one or two courses set tight as spreaders, and whether the amount of fuel in each case would be the same. I have usually set three over three, above the benches, with a couple of flat courses of burnt brick on the kiln to hold the heat, with very good results; but am of the impression that a couple of tight courses about equal distance apart in setting 35 or 40 high, would be better.

A YOUNG CONNECTICUT BRICKMAKER.

From a Brickyard to the State House.

Editor Clay-Worker:

Enclosed you will find $1.00, for which you will please renew my subscription to your paper. As long as I continue in the brick business, I want to see all the new ideas that may be advanced in the trade. To get them there is no better medium that I know of than reading your reports of the work of the conventions, as well as practical communications from the craftsmen. Every brickmaker in the country should read the Clay-Worker. The brick trade hereabouts has been very dull for more than a year, but under the administration of our new brickmaker Governor the prospect looks more favorable for this year. Perhaps there are few who know that General Alvin P. Hoovey, now Governor of Indiana, was once as poor as the poorest of us, and worked in the brickyard, but such is the fact, so here is encouragement for a class who have been looked down upon as worthy of little consideration. Thanks to the efforts of a few enterprising, energetic men, the trade is taking its place at the front of the leading manufactories where it belongs. So that, though a boy, starting like General Hovey, wearing his rags and working like a slave, even in a brickyard, may with proper energy and intelligence, stand at the very top of the ladder of fame. But the world moves, and so does the trade of brickmaking. I hope you will continue to prosper.

EDWARD BROWN.

MT. VERNON, IND.

The Cost of Burning.

Editor Clay-Worker:

R. R. Gray says "less talk and more figures," and then tells us that "a continuous kiln will burn brick for one-fourth the amount of money that the open kiln will," everything else being equal, and then after scolding us for not giving reliable data to work from, proceeds to give us the figures.

To make everything equal he takes 240,000 brick in an open kiln and 300,000 brick in a continuous kiln. A difference of 60,000, brick. Doesn't give us the time of burning, only says 45 cents per 1,000 for labor; wood, two cords per arch of 20,000 brick at $3.00 per cord, and half-ton coal per arch at $3.50 per ton.

Then he gives us the continuous kiln for 300,000 brick—time of burning, 15 days; 60 tons dust at $2.25; two men at $2.00 per day; total cost in continuous kiln 65 cents per 1,000, and says cost in open kiln is $2.50 per 1,000.

That is a good showing for the continuous if he is right, but is he? Let us make some figures on his basis. I will take the same number of brick as in his continuous kiln, 300,000, or 15 arches of 20,000 each. Take his cost for labor, which is too large, 45 cents per 1,000, $135.00; 30 cords wood, at $3.00, $90.00; 7½ tons of coal, at $3.50, $25.75; total, $250.76, or 83 35-100 cents per 1,000 instead of $2.50.

The last, and as good a kiln as we ever burned, was one of 300,000, in six days, with two men off and two on: four days labor, $48.00; and cost of coal, $150.00; total, $198.00 or 66 cents per 1,000. The kiln before that contained 474,000; same labor, $48.00; coal, $237; total, $285.00; cost per 1,000, 60 60-474 cents.

Do I want any continuous in mine? Not any, thank you. Cost of coal at kiln, $4.25 per ton. We use two courses platting, and cover the top from the heads in one-third of the distance with light sheet iron to hold down the heat and send it to the center where it always comes out last. We also use 30 quarts of anthracite coal dust to every thousand brick in the pugging of the clay. Dimensions of our moulds, 81½ cubic inches. When I get my breath, if Mr. Gray doesn't scalp me, I will try again.

S. P. CRAFTS.

NEW HAVEN, CONN.

From "Way Down East."

Editor Clay-Worker:

I am much interested in the articles in the Clay-Worker on burning and setting.

We in the East use wood for fuel; burn in the old-fashioned open-top kilns, with temporary walls put up and taken down with each kiln. We burn from 40 to 50 cords of forest wood to the 100 M., at a cost of from $2.50 to $3.00 per cord.

It appears to me, that the expense for fuel is too large, as I read the figures in the estimates of your correspondents. I would like to ask your old burners whether they "coal" in watersmoking or settling. Our way here is this: When the kiln is scoved and daubed, we commence a fire in the mouth of the arches, let it work in gradually (the arches being charged with wood when set) until the charging is burned out, then we let the arches cool until they are dark, when we fill them again with dry clifted wood and start the fire again until this filling is burned out, when we do the same thing again until the steam is off and the fire or heat begins to show at the top, then we shut up one head or close the arches on one side tight and burn out a filling or "dressing," as we call it, then we cool again until the arches are dark, when we fill again and burn from the opposite side or head; this we continue to do until we have the proper settle—about 14 inches. Usually we are about five days in getting watersmoke off, and four to five days in settling making the whole time from nine to twelve days. We call a kiln good when the hard brick are within two courses of the top, and one or two from the heads or ends.

From what I read of your burns in the West I infer you get a much larger per cent. of hard brick than we do.

We set our arches ten high, and kilns from 38 to 42 brick high, and about 45 brick long. If we get 200,000 merchantable hard brick we call it a good burn.

Of course we have a large amount of bats including our walls. Our markets are mostly the cities and large towns, and the larger part of our brick go by water. Our clay is of a superior quality, easily worked, and we make only soft mud brick, take our clay from bank to soak pit. Our yards are all on the river, or near the shipping port.

I think our great mistake here is in burning. I am satisfied we might economize our fuel with improved kilns and improved methods of burning.

South Penobscot, Me. E. R. B.

A Good Word For Continuous Kilns.

Editor Clay-Worker:

I wish to say something in favor of continuous kilns. I have a Boehncke & Rohwer Continuous Kiln on the yard I am superintending. This kiln was built last year, but the whole business was started too late in the season, so that they could not make bricks enough to run the kiln through the rainy season. I had to stop making bricks on the 12th of November on account of the rain setting in. Having no drying sheds on my yard at all and using the Fletcher & Thomas Pallet System, I lost about 200,000 green bricks in one night. We do not need drying sheds here in this beautiful country, because not a drop of rain will come during the time from about April 1st to October last; so we are able to make bricks enough during this time to run the kiln all year round. And I will do so this year. My two Quaker machines give me 60,000 bricks every day, 30,000 I need for my kiln and the rest I store away for winter use. I dump the bricks on pallets and use horse trucks to convey them on the yard, where the pallets are piled up ten high and three to four feet apart. In this way the bricks are bone-dry after three or four days.

Also, I use horse carts to take the bricks from the yard into the kiln, four hundred bricks making one load.

My kiln works splendid, like all the kilns of this kind built in the U. S. We have not one salmon brick in a compartment of 25,000. If the green bricks are put in dry enough and the fire watched carefully, the burnt bricks are very near all even in color and quality, and this without any loss on account of brickbats or cracked and broken bricks, and with very much less fuel than anyone else can burn bricks with in this country. I use a New Mexico screened coal, which costs $7.00 brought to my yard. I need about two and a half tons a day to burn 25,000 bricks, so that 1,000 bricks require about 75 cents worth of fuel. Every other brick yard will need about $3.00 to $3.50 here in this country.

Of course the erection of a Boehncke & Rohwer Continuous Kiln might be more expensive than that of another good kiln, but this expense will be made up in one year by saving in fuel. Besides that, I only need one firemen at a time.

I am very sorry that Mr. Daniel Edward Ryan, who gave "A Pilgrim's Views and Observations" in your last No. did not visit the brickworks of the Sacramento Transportation Co., at Sacramento, Cal., and that "A Student," who was "Among the Brickmakers," did not find the two kilns at the Brick & Terra Cotta Mfg. Co., at Omaha, in running shape. Both gentlemen would be convinced that the Boehncke & Rohwer kilns give perfect satisfaction. F. HARPER.

Inglewood, Cal.

Starting Right.

Editor Clay-Worker:

Inclosed find one dollar, for which please send us the Clay-Worker, for one year. The Clay-Worker is indispensible to brick makers, and as we are to begin the manufacture of brick very soon at this place. we thought the first thing to do would be to subscribe to the Clay-Worker. We are to put in Brewer's latest improved machine, which will be run by a twenty-five horse-power Water Town engine. Our capacity will be 35,000 brick a day. Wishing the Clay-Worker much prosperity.

GARY PITMAN & Co.

ALBANY, GA.

The "Yellow Dorg" Again.

Editor Clay-Worker:

I don't know that I, your humble "yaller dorg" country correspondent, can write anything that will interest your many readers, but, you see it just popped into my head to say a few words about how we used to prepare clay for brickmaking, when I was an apprentice boy.

To begin, we dug the clay in the fall, winter and spring, at times when we could do nothing else. The boss kept us busy for months, digging and wheeling clay into great mounds, to take the rains, frost and ice, until the season opened for brickmaking. Well, what do you think? Let me tell you, that that clay when it was "ground," "tempered" and "pugged," (I believe scientific brick manufacturers use the above terms), worked into mud suitable for hand-moulding, was nearly good enough to eat.

But, of course, it's not up with the times now-a-days. To work clay direct from the bank or pit, is the rage. Now, sir, I feel in my bones as "yer yaller dorg" brickmaker, to attempt to convince any one that digging clay months before it is needed for brickmaking, is an advantage, would be up-hill business.

It is said that improved machinery does the work now. May-be it does. But I for one am not fully satisfied on that point.

Now don't, whatever you do, understand me as one opposed to machinery. No sir, not once.

Yet, I am inclined to the opinion, after years of experience and trials in a small way, that all clay, so far as I have seen, will work better and smoother, and can be moulded either by hand or machinery with greater ease, when, as I stated, the clay has been dug months before using, giving time by the action of the weather on it to sweat and crumble little by little of its own accord. It is, so to speak, live clay, and when thrown into the soak pit it loses all of its rough parts and works more like good wheat dough.

If you are making brick by the "semi-dry clay' or "stiff mud process," you can do so with clay thus prepared. You need not dump the clay into a soak pit.

I feel a little ticklish about what I am writing, because, you see, some of the big city "brick factorisfs" might lick me. As "yer yaller dorg" brickmaker you see, I haven't had the chance to delve down deep into the science of clayology.

You see, too, that some of my words are not of the latest date. Particularly so those on the scientific terms now in vogue by brick factorists.

Never mind, I am learning slowly. I have just ordered a Latin dictionary from New York. As soon as it arrives I shall paint in large Latin letters, "*E Pluribus Unum*," and proceed to nail it up for my brick yard sign. I think it will take right along. Don't you?

I hope the brickmakers had a good, pleasant and jolly time at Memphis. May they one and all live to meet again many times as the years come and go.

A COUNTRY BRICKMAKER.

Information Wanted.

Editor Clay-Worker:

Can you give me the address of some one who makes a patent draw lime kiln, one of the best in use. What machine do you consider the best for paving brick? I use the J. W. Penfield stiff-mud machine, side cut, but it looks to me the end-cut would be the best. I have a very fine clay for both white and red brick, and I think the clay will make a fine paving brick. I use the Raymond Repress, and must say that I am proud of the brick I make with it. I shall put the terra cotta dies on this year, and make both white and red trimmings. All the trouble I have is with the red, they are hardly as dark as I would like, and if I am not very careful to get them perfectly dry before setting they will have a little white stain. I set face to face so the ends are the most bother, and on ornaments they bother, but after they are burned and exposed to the weather, they grow nicer all the time, and a little darker. This white stain does not get any worse, but better with age. But if I make the ornaments of it, then I will be bothered more, and if you can suggest anything that will be of help to me, you will do me a great favor.

CHAS. MARSHALL.

LAZY WORKMEN.

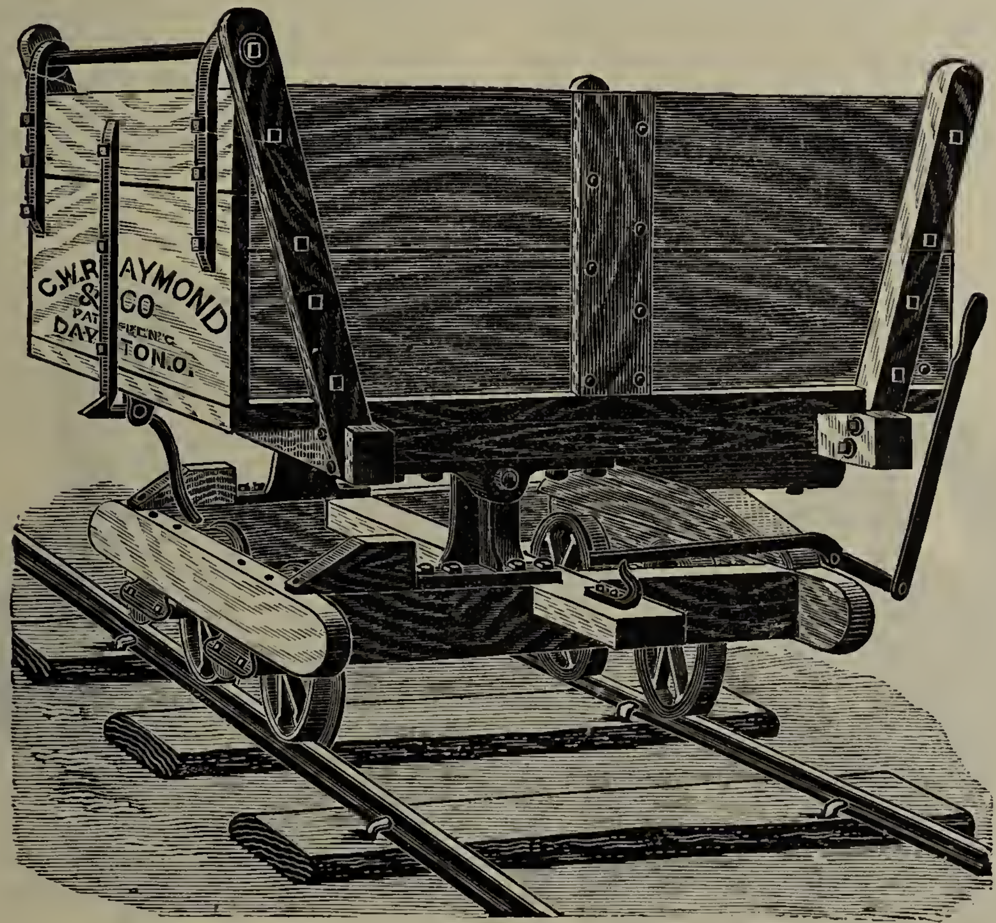
There are some men who are too indolent to make any improvement in their workmanship, being perfectly satisfied to plod along in the old ruts that have been made by their predecessor, content to take things as they find them, and make no effort toward improvement. This is a progressive age, and one calling for progressive minds to develop. With all the inducements that are offered at the present time, the mechanic who will not at least make an effort to rise is very indifferent indeed.—*Ex.*

AUTOMATIC DUMPING CARS.

We give on this page illustrations of "Raymond's Automatic Dumping Cars." The demand for a car of this kind for light griading, gravel pits, brickyards, plantations, mines, etc., led to its invention.

It has so far met all requirements, being on several occasions put to the most severe tests of earth transportation. The novelty of the cars consists in their being entirely automatic.

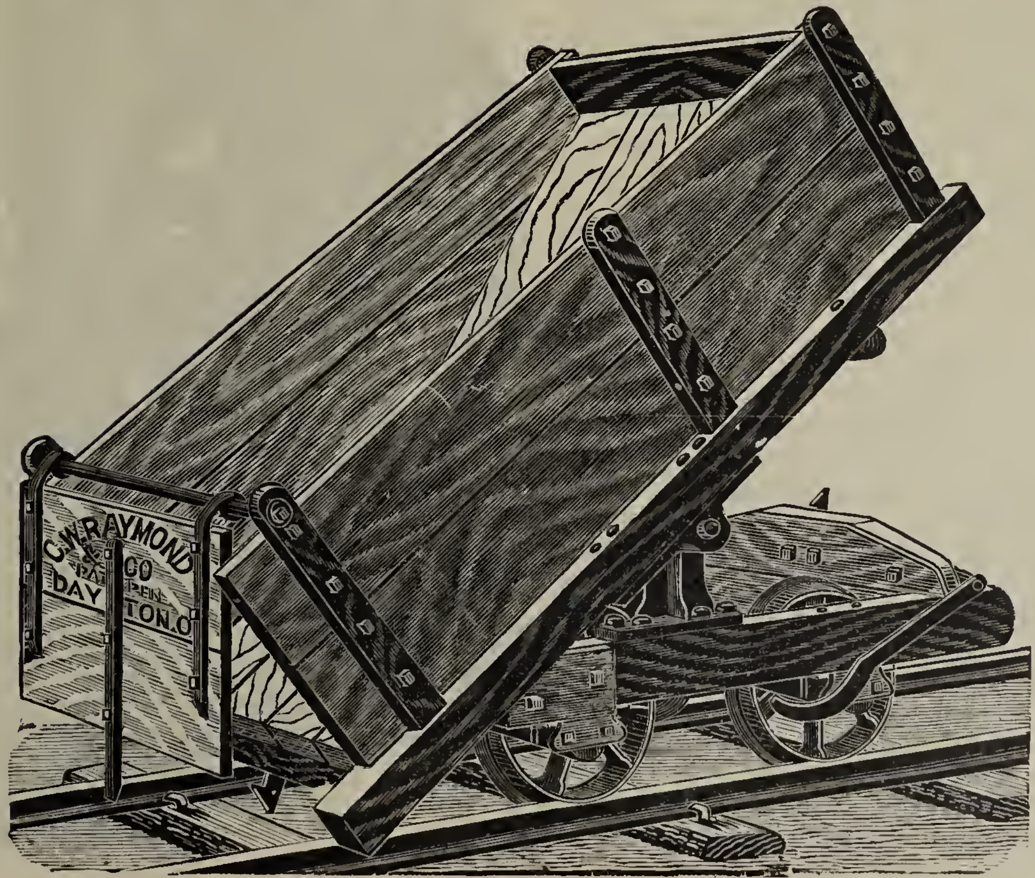
By throwing the lever, which can be done by a boy, the bed dumps by weight of the load, the greater weight being upon the dumping side of the pivot bar. After load is expelled; the preponderance of weight being upon the reverse side, causes the bed to right itself on the trucks, locking itself securely thereto and fastening its own end gate.



No labor is required either to dump the load or return the empty bed to position.

The large cut shows the side dump 1½ and 2 cubic yards capacity. Cars of 30-inch guage of these sizes are kept in stock, Cut No. 2 shows the end dump 1 and 1½ cubic yards capacity. The latter car is especially adapted to brick-yard work, dumping into pug mills, soak pits, etc. This car can be dumped by arranging a trip bar on the track, which, as the loaded car is drawn past raises the lever, which secures the bed to the trucks allowing it to dump as before described, at any desired point. The same car is also made with a rotary attachment which allows the load to dump on either side or end.

They are strongly built of best seasoned white oak. Self-oiling boxes and chilled wheels are used in construction. They are in fact, fully up to the highest standard of work of their class. They will be manufactured by C. W. Raymond & Co., of Dayton, Ohio, who are now erecting a large plant to better facilitate their rapid production.



A POTTERY EXPOSITION.

An important movement has been started for the holding of another pottery, porcelain and glassware Exposition in Philadelphia this fall. The Exposition will de held under the supervision of the Committee on Exhibitions of the Pennsylvania Museum and School of Industrial Art.

The American Potters' Association at their last annual convention held at Washington, D. C., selected a special committee to report in reference to the proposed exhibition. This committee presented a carefully prepared report from which the following is an extract:

"The place of art is not only in public galleries. It is, above all, in the house and at the fireside of the people. Being very largely an agricultural community, the people of the U. S. must of necessity, with accelerated strides, become more and more manufacturers. To be successful it is clear that our manufacturers must become more and more artistic; must put more of the art quality into their work, for the U. S. pays millions every year to the superior artists and artisans of other countries. The labor we have to dread is the skilled labor of the old world. * * Our art publications, our magazines with their marvellous illustrations, are doing much to uplift the wares, but many of our people do not come under their influence; cannot afford to buy, but they must have a cup to drink from, a jug to hold water, and by giving them these articles beautiful in form and decoration, simple and inexpensive though they be, we can do much to train the eye, and thus meet the minds and hearts of men and women. * *

A meeting will be held in the early future at Philadelphia, where the Trustees of the Pennsylvania Museum will confer with the Potters Committee and prominent manufacturers and individuals interested in the projected exposition. The preliminary arrangements will be decided upon, schedules of prices made, etc. It is expected that the display of stained glass and glass ware will be very handsome. Connected with the regular exhibition there will be a loan collection and a large and valuable historic exhibit."

A SPLENDID BRICK PRESS.

We illustrate herewith The "Brewis" Dry or Semi-Dry Press Brick Machine (Pat'd. Aug. 18, '85, and Jany. 8, '89,) which as it is now placed on the market is the most perfect Dry or Semi Dry Press Brick Machine built. These machines have now been on yards in practical operation since 1885, during which time improvements and changes have been made, the objectional features removed and weak parts made stronger, until a strength, simplicity of construction and perfection have been attained, which make it the most powerful, efficient and durable machine yet produced, and practically unbreakable.

Mess. Chas. Kaestner & Co., Machinists and Founders of Chicago, Ills., well and favorably known as extensive manufacturers of Clay Working Machinery, being convinced of its superiority over all competitors, have made its construction a special study and will keep on hand a complete line of all sizes, that may be called for, One, Two and Three Mould, with capacities ranging from 7 to 21,000 in ten hours.

The following description with illustration serves to make those interested, acquainted with some of its claims to superiority:

The main frames in which the Pressing Mechanism works and which also furnish bearings for the main Crank Shaft and Counter shafts are all fitted together with planed surfaces and so bolted together with an interior frame and the mould table with turned bolts as to allow no opportunity to get out of alignment, thus always making a perfectly true and square cornered brick. The machine is built with two sets of toggles, operated by a double Cast Steel Crank Shaft, which operating the toggles in different directions and against each other, entirely relieve the Frame from any of the Thrust or Strain peculiar to this class of machines. Besides having the advantage of more wearing surfaces. Connecting the upper ends of the toggles with the lower Cross head carrying the lower dies, are the main "Side Bars" which having a cross section of 22 square inches of hammered steel, entirely avoid all springing under the immense strains they are subjected to during the pressing and lifting out of the brick.

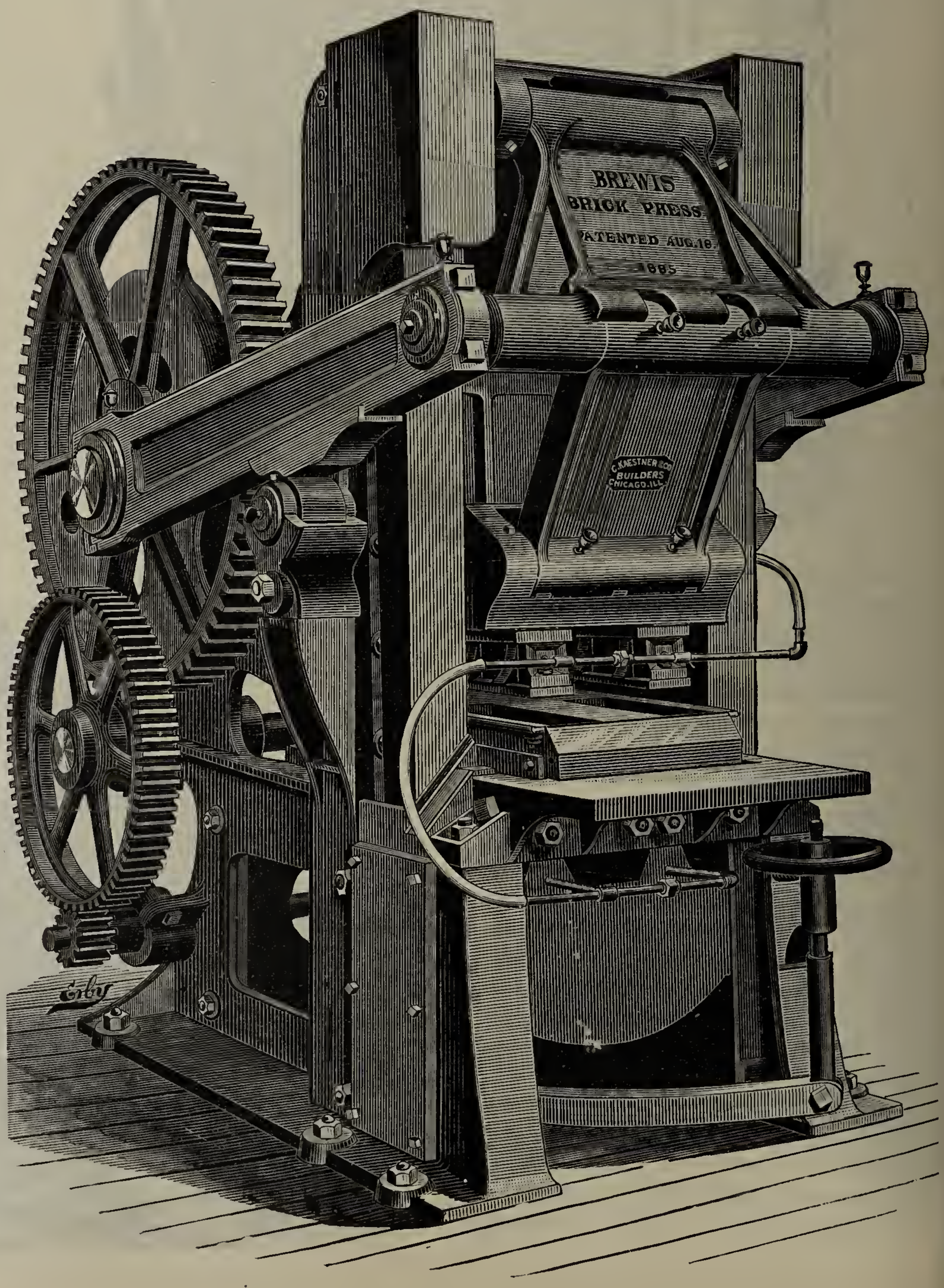
The mould table is fitted with a feed box of improved and patented construction and capable of adjustment in any direction where there is any liability to wear, thus rendering the work of the machine accurate, in this one of its principal parts. These moulds are fitted with Steel liners which Messrs. Kæstner & Co. have manufactured expressly for this purpose, combining the greatest amount of wear with a smooth and polished surface, these liners can be taken out for replacement, either with a new set or special set to make fancy brick that an architect may call for, in an incredible short space of time. They are also provided with dies having steam heating appliances to prevent the adhering of clay that may have to be worked damp and is therefore sticky.

All Shafts, Bolts, Pins, Friction Rolls and wearing surfaces that are subjected to either wear or tear, and strains are made of Hammered or Cast Steel, as are also the cross heads connecting toggles, side bars and the one carrying the upper dies, thus extending the life of a machine by reducing the wear and obviating the chances of breakage.

This machine free from any weights, drops, or non-positive mechanism, but by movements peculiar to itself, and which are securely covered by letters patent combines a moving and pressing of the clay within the mould, which by entirely working out the air, produces a brick void of any granulated center surfaces, as each brick is made at the lower part of the mould, by traveling up they are given a polish and smoothness hitherto unattained, except partially in a so-called "Cam" machine, the best samples of which, would bear no comparison to one of this principle, as any disinterested user can testify. Each machine is fitted up with one of the Kæstner Pat'd. Friction Pulleys to place the machine more completely under the control of the operator and subjected to more severe tests before leaving shop than it will ever be called upon to perform in any yard, even in the most careless hands.

The manufacturers determined from the first undertaking of its construction to combine the greatest strength, simplicity and speed possible, as well as the delivery of the brick with perfect faces, edges and corners square or ornamental and in every way a desirable product and from the record the machines have already made, they feel sure that they are presenting to the trade a machine in every way worthy of public favor.

Messrs. Kæstner & Co., the sole licensees, are prepared to furnish the machines on the most favorable terms and will ship them to responsible parties, al-



lowing an actual trial of thirty days before settlement is asked. Where other machines are now being operated on yards they will place the "Brewis" Improved Machine alongside, and if the brick made upon it are not better in every particular, purchasers are at liberty to return the machine free of expense to them.

Those interested in the manufacture of fine brick we are confident will find it will pay to write to Mess. Kæstner & Co. for full particulars. Clays sent to them will be tested free of charge and the sample brick returned.

Testimonial.

Office of Hampshire Pressed Brick Co.,
Hampshire, Ills., February 15, '89.
Messrs. Chas. Kaestner & Co., Chicago, Ills.

GENTLEMEN:—Before purchasing our Brewis Brick Press last season, we thoroughly investigated the merits of all so-called first class Press Brick Machines, and selected the Brewis (formerly the Acme) because we considered it the strongest, and least liable to wear. We are pleased with our machine and will show it to intending purchasers, at work on our clay, which many of the machines seeking favor failed to handle. We believe the Brewis to be the best machine made.

Yours truly,
MARTIN STRYKER, Pres.

Messrs. Kæstner & Co. also have an extensive trade in Engines, Boilers, Pumps, Shaftings, Pulleys, Hangers, etc., and make a specialty of the Boyd & Raymond Pulverizers, which they offer at prices that defy competition. Write for prices addressing Chas. Kæstner & Co., 303-311 South Canal St., Chicago, Ill.

NOTES BY THE WAY.

At Marion, O., the Marion Steam Shovel Co. are having a large demand for their Clay Excavators, seven of which they have put into Chicago brick yards. Mention of some of these excavators have been made before in the Clay-Worker. The firm speaks in very high terms of the Clay-Worker as an advertising medium. The business of this firm has grown so rapidly that they have had to increase their capacity in many ways to upply the demand for their goods.

BUCYRUS, O.

The Frey-Sheckler Co. is behind on orders. The reorganization has given them the use of a large building and increased capital, adding very much to their capacity. In addition they are planning extensive additions to their present buildings. They are planning to so increase their manufacturing facilities as to meet every order for clay working machinery promptly. At present they are compelled to beg for a little time on some of their orders. They have some valuable improvements which they have perfected within the past year which will further add to the popularity of their machinery.

This firm is giving special attention to the matter of furnishing plans for plants and other needed information to those who may be establishing or enlarging brick or tile works. At

TECUMSEH, MICH., H. BREWER & CO.,

Are compelled to add night hours to the day to meet their orders. Among the many valuable improvements that they have added to the extensive line of their machinery the past few years, we make special mention of their Automatic Cut-off for brick, both side and end-cut. We witnessed its operation with interest. It is a marvel of simplicity and efficiency, cutting two streams of clay at once, making four brick at each operation, of exact length. In looking at it operate the relation of part to part, the why and how it is done with such perfection can be seen at a glance. The cutting of side-cut brick is quite as perfectly done, There is not a catch, hitch or skip of any kind, it does the work and does it well. Their No. 6 Brick and Tile Machine is meeting the demands of the trade; the only trouble at this time is to supply the number of machines demanded. Orders have been coming in every day and still they come.

The Brewer-Sword Brick Machine manufactured by this firm is having a good run. They are more largely in demand in the Southern States. H. Brewer & Co. have added new improvements to this machine, increasing its popularity very much. They also manufacture the Sword Brick Machine.

Very few manufacturers can say as much as this firm in the general satisfaction rendered in the conduct of their trade. They make it their business to see that their machinery gives satisfaction. They are always to the front in every needed improvement. They have under way other surprises for their trade.

KELLS & SONS, ADRIAN, MICH.

This firm is still the same stand-by, making no ado over their business, but making haste slowly, supplying the demand as faithfully as if the earth's revolutions depended upon it. They report a good trade.

THE ADRIAN BRICK & TILE MACHINE CO.

This firm has an Automatic Cut-off Table that works very satisfactorily indeed. They are giving much attention to the manufacture of machinery adapted to brickmaking. They have put a large number of their machines in the brick yards at Kansas City. They report a very satisfactory trade so far, this season.

THE MICHIGAN BRICK & TILE MACHINE CO.,
MORENCI, MICH.

Are making a specialty of Brick and Terra Cotta Lumber Machines. For the manufacture of terra cotta lumber they claim a special superiority. They have more orders for machines for this purpose than they are able to supply.

IOWA TILE, BRICK AND DRAINAGE ASSOCIATION.

The Iowa Tile, Brick and Drainage Association held their annual meeting in Agricultural Hall of the capitol building in Des Moines, February 6th and 7th. The attendance was good and the papers and discussions of more than ordinary interest. The members very generally reported an improvement in sales and prospects good, with few exceptions. The drouth of two years past seriously effected the tile trade but the later rains have revived the trade. The brick trade is reported uniformly good, and very many tile men have added the manufacture of brick to their business. The use of brick for street paving received much attention. Members of the city council were present to learn all about it. Mr. J. J. W. Billingsley, of the Clay-Worker, by request, read a paper upon the subject before the convention, which we give in full on preceding page of this number.

The city of Des Moines has contracted for all the brick paving that manufacturers of paving brick in that vicinity can supply. There is an abundance of good clay near the city. The only question is capital and men to make the brick. Several moneyed men were present ready to establish plants if the prospects justified the investment.

At the close of the meeting we were informed that three companies were organizing to put in brick works.

The following were elected officers for the ensuing year: President, T. E. Haines, Altoona; Vice-President, Harry P. Smith, North English; Secretary, G. S. Chambers, Des Moines; Ass't Secretary, J. L. Smith, North English; Treasurer, Wm. Kettell, Tipton, Ia.

Next annual meeting will occur on the second Wednesday in February, 1890, at Des Moines.

THE CLAY-WORKER

INDIANAPOLIS, IND., March, 1889.

Entered at the Post-Office at Indianapolis, Indiana, as second-class matter.

Terms of Subscription.

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☞Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES FURNISHED ON APPLICATION.

Correspondence on all subjects of interest to Clay Workers is solicited. Communications from practical men will always be welcome. Address all communications to

T. A. RANDALL & CO.,
25 Thorpe Block, Indianapolis.

RATHER PERSONAL.

If a little pride is ever pardonable it is when one dons new garments. Pardon the CLAY-WORKER, therefore, gentle reader, if we seem a little vain as we make a complacent bow and present ourself in a new dress. While we are proud of our improved appearance we are determined that the improvement shall not be in appearance only. At every point where improvement is possible, whether in the matter presented to our readers or in the manner of presenting it, we are determined to forge our way ahead and compass the widest possible field for the benefit of our readers and advertisers. Those who are following after must quicken their pace if they keep in sight.

In this issue we present several papers of more than passing interest and value that should receive careful consideration from every reader. To our mind this is an exceptionally valuable number, rich in practical thought and suggestion. Prof. I. O. Baker's contribution under the title, "Testing Brick," should receive special attention. There is a false impression in the minds of many as to the strain put upon brick—the weight they must sustain in ordinary buildings. What are usually termed soft brick are amply strong enough for all ordinary building purposes. We do not say this to encourage the manufacture and use of poor brick. Not at all, but rather to combat the idea entertained by some who ought to know better that a brick suitable for walls that must sustain heavy weight should show a crushing strength of several thousand pounds per square inch.

DON'T MISS IT.—The following (April) issue of the CLAY-WORKER will be an unusually valuable number. We already have some very interesting communications from both old and new contributors. Among the latter, and worthy of special mention, is the first of a series of articles on "Brickmaking and Burning," written especially for the Clay-Worker by Mr. Jno. Crary, an able writer, and, as well, a brickmaker of sixty years' experience, having been actively engaged in the business from boyhood, working nearly all kinds of clay, both North and South, from which brick can be made, thus being perfectly familiar with every method and detail. These articles treating as they will in a plain terse style of the whole art of brickmaking must prove of great value. Prof. R. C. Carpenter will also have a valuable paper in the April number on *"The Strength of Brickwork and other Qualities."* As we said before, don't miss it.

A TRIP EAST.

Early in February in company with a baker's dozen of jovial companions, members of the Indianapolis Builders' Exchange, we steamed out from the Hoosier capital bound for the city of "Brotherly Love," to attend the third annual convention of the National Builders' Association.

Though long, the journey was a pleasant one, time cannot drag heavy in such company.

Our genial friend and neighbor, J. C. Adams, "Brickmaker to the President," officiated as chaplain and set the "pace," which, though by no means slow, was maintained to the finish. Many pleasant incidents occurred during the trip that may happily be lived over again and again, in memory at least.

AT PHILADELPHIA

Our hearts were made glad by cheerful greetings from friends, many of whom we had not seen for a twelve month, and we were treated to such an exhibition of warm hearted fellowship that it makes us hold our fellows at a high premium.

Never have craftsmen been more royally entertained than were the Builders and their friends by the Philadelphia Builders' Exchange, whose hospitality knew no bounds.

THE BUILDERS' CONVENTION.

A fine body of business men, well groomed and seemingly on good terms with themselves and all mankind, assembled in the convention hall, Franklin Institute, Philadelphia, Tuesday, February 12th, and took up the associational work in good earnest. The attendance was all that was anticipated, the list of members showing a substantial increase over the previous year.

Many questions of importance were considered and several valuable papers on subjects of interest to builders were read and discussed. As a verbatim report will be made and published in pamphlet form a copy of which can be secured by any who are interested by applying to the Secretary, Wm. H. Sayward, of Boston. Mass., we will not now undertake to mention further the proceedings except to add that the next meeting will be held in St. Paul, Minn., January 20th, 1890. The following is the result of the

ELECTION OF OFFICERS:

President, EDWARD E. SCRIBNER, St. Paul, Minn.

First Vice-Pres., JNO. J. TUCKER, New York City.

Second Vice-Pres., A. MCALLISTER, Cleveland, O.

Secretary, WM. H. SAYWARD, Boston, Mass.

Treasurer, GEO. H. TAPPER, Chicago, Illinois.

THE BANQUET,

Which seems to be an established feature of the meetings, was given in the Horticultural Hall, which was beautifully decorated. More than six hundred happy mortals were here treated to a rare feast. On every plate was laid a "menu card" and souvenir of great beauty in the form of a book bound in satin bearing upon the cover the inscription, in gold, "Plans and Specifications." In addition to the menu, toasts and programme, the book contained some excellent engravings of prominent buildings in Philadelphia, all executed in the richest manner.

During the banquet a handsome portrait of Mr. John S. Stevens, ex-President of the National Association, was unveiled and presented to him. His colleagues on the Board of Directors of the Philadelphia Exchange also presented him with a magnificent gold watch and chain. He responded fittingly to each presentation.

After the "feed," which was most bounteous, followed a real "feast of reason and flow of soul" which lasted till the "wee small hours."

TO THE BRICK YARD.

The Peerless Brick Company having invited all who were interested to visit their extensive works, about two hundred went out Friday morning on a special train provided for the occasion and were shown through the works by the officers of the company, who presented each visitor with a pretty souvenir in the form of an 8-page pamphlet containing a bird's eye view of the works and a cut of a handsome fireplace constructed of their brick, both of which we hope to present to our readers in the next issue of the Clay-Worker with a full description of the plant. They also surprised their visitors with an appetizing lunch which was heartily appreciated of which fact they had ocular demonstration.

A PLEASANT EVENING

Was spent with the Philadelphia Brickmakers' Association, they having requested those of us who were interested in the National Brick Manufacturers' Association to meet with them in their hall, Wednesday, February 13th. The presence of our colleagues, D. V. Purington, Chicago, C. P. Merwin, Berlin, Conn., J. C. Adams, Indianapolis, and Geo. W. Sharer, Terre Haute, Ind., all of whom were called on for speeches and responded cheerily, made the occasion a pleasant reminder of the memorable days spent in Memphis.

There was also present several craftsmen from Baltimore and other points.

The Secretary, Mr. W. F. Miller, read the minutes of the previous meeting when it had been decided that they (the Philadelphia Brickmakers' Association) join the National Brick Manufacturers' Association in a body and to extend a cordial invitation to the latter to hold their fourth annual convention in Philadelphia, December 10th, 11th and 12th, 1889. In as much as a large majority of the members in the National Association at their last meeting expressed a desire to hold the next meeting in the East, it is safe to predict that the invitation will be accepted.

After the transaction of some routine business the convention adjourned and the guests donned their overcoats and prepared to say good bye, but to their surprise were conducted to an adjoining room where a pleasant sight met their gaze.

WINED AND DENIED.

A sumptuous supper had been prepared and we were bid to partake thereof generously. It soon developed into an elegant "tea party." Their large hearted President, Sam'l Huhn, presided and in his own peculiar style called out Brothers McAvoy, Gillespie, Webster, Dobbins, Dowler, Flood, and others, who expressed their "sentiments" in a manner that convinced their guests that the Philadelphia brickmakers are *"all right."* They know their business and IF they are a little slow they are not tongue-tied in the least and are one and all "jolly good fellows."

AT BALTIMORE

We had the pleasure of meeting W. H. Perot & Son and visited their brick yard and terra cotta works. The former was not in operation but we made a hurried trip through it glancing at the piles of fine pressed and ornamental brick in the sheds as we passed. They make by the soft mud process, using a Newell Mill to grind the clay and two Martin machines. Dry artificially with Sharer's tunnel system, with which they are well pleased, and burn in open top kilns. In the terra cotta works we found them busily at work turning out ware that made us stare. Their clay is so fine and so well adapted to this work that they are able to mould and burn immense pieces weighing hundreds of pounds without the least trouble and that too with the clay just as it comes from the bank without the least admixture of any other material or clay; something we have not seen done before.

They are making excellent ware for which there is a large and increasing demand.

No other yards were in operation here, so we turn our steps homeward stopping

AT PITTSBURGH

Long enough to renew old acquaintances and make some new ones among the craft. We are especially indebted to Mr. A. A. Hersperger, of the Wittmer Brick Co., for many courtesies and also to our friend, D. C. Cawley, who will be remembered pleasantly by all who attended the National convention at Chicago. In this vicinity natural gas is used exclusively for burning and with good results. Unfortunately the supply of gas is controlled by corporations and the price has been put up till it is more expensive than coal but the advantages in the saving of labor justify its use.

Throughout the East we found every indication of material prosperity and growth, and in all clay work especially there is a fine prospect for an unusually busy season.

Those who are experiencing difficulty in burning brick with natural gas may find a hint as to the cause of their trouble in Dr. Brown's paper on another page. We are inclined to attribute the difficulty to the intensity of the heat engendered with the gas which causes the difference in color. This may be regulated by reducing the pressure or volume of gas entering the kiln.

THE PAVING BRICK INTEREST.

At Lincoln, Nebraska, the interest in paving streets with brick is at fever heat. The city has contracted for the laying of 17,000,000 of pavers which will aggregate about seven miles of streets. The Vitrified Paving and Prepared Brick Co., of Lincoln, has contracted to make the brick and construct the paving. Besides this contract other contractors are making preparation to manufacture pavers as well as common brick.

The above company has put in two Penfield Mills, crushers, elevators, etc., and have also constructed Penfield Dryers having a drying capacity of 80,000 brick in twenty-four hours.

The company have erected five Eudaly Kilns each holding 240,000. The entire plant when fully complete will cost near $100,000.

The company have already made several kilns of brick, and the quality so far as we can judge is excellent. The burn from top to bottom and in all parts of the kiln is certainly as good as could well be desired. The brick are so hard that it is difficult to break them by striking them together. They have the appearance of being glazed, and they are generally perfect in form. The company have an abundance of clay.

AT DES MOINES, IA.,

The city council have already favorably considered the use of brick in paving the streets in that city. They have already laid a half mile or more, and have ordered the paving of ten miles of streets if the brick can be had. At the time of our visit (Feb'y 6th and 7th) several parties were present in the city considering the expediency of investing capital in brick plants near that city. We were informed before leaving that one company had effected an organization.

The general interest manifested in this branch of the clay working industry is commanding the attention of all classes of people. People in these states are beginning to talk about paving public highways with brick. It is suggested that the travel-way can be paved a width of eighteen feet and answer every purpose, making a good highway for travel for all seasons of the year at a reasonable expense. Indeed, the use of brick for paving public highways will be thought feasible at no distant day.

EDITORIAL NOTES and CLIPPINGS.

M. F. Wharton is thinking of starting a brick yard at Troy, Ky.

Puyallup, W. T., is to have a brick and tile factory.

Page Bros. will start a brick yard at Gordonsville, Tenn.

C. S. Dean, may start a brick yard at Nicholasville, Ky.

Holt & Hill will start a brick yard at Montezuma, Ga.

Turpenning & Bunds will make brick at Prairie Grove, Ala.

Bryant & Shackelford will build brick and tile works at Water Valley, Miss.

Robert Melcher is to start a pottery at Weatherford, Tex.

The Carrollton (Ohio) Fire Clay Co. has been incorporated.

J. W. Grissard will start a brick yard at Winchester, Tenn.

A. J. Douglass, Covington, Tenn., will build tile works.

Milton Park writes that he is thinking of going into the manufacture of brick at Greenville, Ala.

A new firm with capital of $50,000 has been organized at Pueblo, Colo., to manufacture Brick, Tile, etc.

It is reported that a valuable bed of fine fire clay has been discovered near Franklin, N. Y.

The Anna River Brick Co., of Detroit, Mich., have increased their capital stock to $40,000.

The Table Rock (Neb) Clay Co. has been organized and will start a brick yard.

R. Ranken is starting a small Terra Cotta plant at Lansingburgh, near Troy, N. Y.

Linley, Wright & Co. will operate an extensive brick yard at East Brookfield, Mass.

Charles H. Price, Jr., and John S. Horton, of Mecham's River, will start a brick yard at Riverside, Va.

Read the "For Sale, Wanted, Etc." columns for experienced help, situations, second hand machinery, etc.

F. W. Pusey's Tile Factory, north of Shelbyville, Ind., was burned recently. Loss $800. No insurance.

The Koch Hydraulic Brick Machine Co. of East St. Louis, Ill., has been incorporated, capital stock $250,000.

It is reported that a company is being organized at Trinidad, Col., to erect a large brick plant there.

The Webster City (Ia.) Brick & Tile Co., has been incorporated. Capital $50,000.

Chas. H. Dunn, Eauclaire, Wis., has purchased clay lands and will start a fire brick factory near Birmingham, Ala.

A subscriber at Worcester, Mass., Mr. H. A. Cook, writes that he has invented a process by which he produces good brick without clay and without burning. We wait anxiously for full particulars.

The Helena (Ark.) Brick and M'f'g Co. has been incorporated, capital stock $25,000. H. S. Horner is president.

Roswell H. Howard, one of the oldest brickmakers in Massachusetts, died recently at his home in East Amherst.

P. S. Wentzel and W. W. Johnson contemplate establishing Fire Brick and Sewer Pipe Works at Weatherford, Tex.

J. & T. Gillespie had a fire at their yards near Philadelphia recently, doing about $1,000 damage.

The brick yards of L. E. Jarden & Co., near Philadelphia, were partially destroyed by fire recently; loss, $6,000.

Britt, Ia., is thought to offer advantages for the location of a tile factory. For particulars write to Mr. F. B. Rogers.

The Indianapolis Pottery was burned recently; loss, $18,000; insurance, $9,000. The works will probably be rebuilt at once.

The Union Brick Co., of Chicago, are putting in another Chamber's machine, and two of Penfield's compound roll crushers.

The Peerless Brick Co., of Chicago, has been incorporated by E. V. Johnson, A. G. Guffin and W. W. Ramsey, capital $50,000.

N. Crutchfield & Co., of Maiden Rock, Wis., are opening up a new yard with a capacity of 35 M. per day. Will use a Penfield New Soft Mud Machine.

The Western Tile Co., of East St. Louis, Ill., has been incorporated by H. K. Givens, J. W. Harrison and John M. Reynolds. Capital $60,000.

The Washington Brick & Lime Co., of Spokane Falls, W. T., are running a brick yard near that city with daily capacity of 70,000 brick.

The Eureka Brick Machine M'f'g Co. have out a new four page circular treating on the manufacture of brick by the dry press process. Send for one.

N. Lemaire, a laborer in Shepherd's Brick Yard, near Montreal, Canada, was crushed to death by the caving in of the clay bank in which he was at work.

Pike & Castle's extensive tile factory at Chenoa, Ill., was burned recently. Loss $15,000. Insurance $5,500. The factory, which was one of the best in the "sucker" state, will be rebuilt at once.

Charles G. Noel and others are to start a small Brick Yard at Williamansett on the "Connecticut River R. R." and will supply part of the Springfield and Holyoke (Mass.) trade.

We are indebted to the Tiffany Pressed Brick Co., 161 La Salle St., Chicago, for a copy of their hand book and price list of ornamental brick which they manufacture in almost endless variety of designs and forms. This little book is of special value to architects and builders, to whom a copy will be sent free.

The Bay City (Mich) Brick and Terra Cotta Co., will make a specialty of brick for street paving, having demonstrated that their clay is superior for that purpose.

The Wage Committee of Clay Assembly No. 6789, K. of L., have made a demand on the boss brickmakers of Philadelphia, for an increase in journeymens' wages of 10 per cent. over last year's schedule.

The Avery Stamping Co., of Cleveland, O., manufacturers of the celebrated Avery steel elevator buckets publish some flattering testimonial letters from parties who have used their buckets. Write them for circulars.

Mr. C. W. Edmunds, of Memphis, Tenn., in renewing his subscription writes that the brick trade there has been good all winter. They have had no severe weather at all and building has gone on without interruption.

Salmen Bros., of Slidell, La., will put in an Iron Clad Dryer. They burn in Morrison Kilns. The last one they built is thirty feet wide, and burns this width as well as 25 feet. They sell most of their product at New Orleans.

The plant of the Riverside Brick Company at Rush Run, Ohio, will be sold by the assignee about April 1. This concern has been very unfortunate, having once before been closed on a sheriff's execution.

The Columbus (O.) Brick and Terra Cotta Co., are enlarging their fire brick plant at Union Furnace, by adding improved machinery, and are building two more Eudaly Kilns to burn their fire brick. They have an excellent fire clay.

E. Harland, of Chicago, will in a few days begin operations on his Indiana yard, using a Penfield No. 20 Brick Machine, Pug Mill, and Conical Corrugated Crusher. He expects to be able to turn out 80 M. brick per day on this yard.

The extensive brick works of Dehaynin, near Marchiennes, La., were burned Feb. 27th. The flames spread to ten reservoirs of tar, each reservoir containing 100,000 gallons, all of which, with a number of barges in the river, were consumed.

The "Grand Automatic" folks of Cincinnati have sold complete plants to B. F. Orten, Philadelphia; Buffalo (N. Y.) Star Brick Co; Higginsville (Mo.) Brick Co., two plants; Leach and Ash, Kokomo, Ind; Michæl Adams, Baltimore, Md; Turner's Falls (Mass) Brick Co.; Higginsville (Mo.) Brick Tile Co.; Eggers & Brock, S. Omaha, Neb; J. H. Sonther, Ripley, Tenn.; R. Watts, Missoula. Mont.; Fox Bros., Springfield, Mass, and Pugging machinery to W. W. Parry, Rome, N. Y., and Holman Bros., Sargent's Bluff, Ia.

Mention the Clay-Worker
When writing to Advertisers
Mention the Clay-Worker.

The Frey-Sheckler Co., of Bucyrus, O., advise us that they now offer the trade an automatic self loading attachment for wire cut brick machines that places the brick on the truck. They are also making a mammoth double machine of the Acme pattern, having a daily capacity of 80,000.

Wm. Jackson & Son, of Duquoin, Ill., write that they have been burning in the old-fashioned way with wood, but have decided to build new Wingard or similar kilns, and add "We have been readers of your valuable paper for several years and think it is just the paper for all interested in the clay business. We would not do without it for many times the subscription price."

The Eureka Brick Machine Mfg. Co., of St. Louis, Mo., report more orders received than ever before, this early in the season. The St. Louis Iron and Machine Works is building twelve of these mammoth machines. The Eureka Co. last season was unable to fill orders for these machines as fast as sales were made. Parties starting brick yards, or wanting new machinery, should investigate the "New Eureka."

Last season was the best financially for "Brick Makers in Springfield, Mass. known for a good many years, brick averaging $7.50 per M. put aboard cars ready for shipment. There were more buildings erected in Springfield last season (or 1888) than in any former year and local papers report a great number of buildings under construction. Harvey Weyant is going to put another machine on his yard which will make three machines to run in his yard next season.

The Atlanta Rubber Co., Atlanta, Ga., will hereafter look after the interests of the New York Belting and Packing Co., in the Southeast. They will carry a very large stock and a complete assortment of their vulcanized rubber goods. The New York Belting and Packing Company is to be congratulated in securing the services of this firm, as the New South is fast developing its manufactures and will constantly demand more and better supplies of this kind, and no one is in a better position to advance their interests in this territory than the Atlanta Rubber Company.

The Kansas City Gravel and Tile Co., have just placed a No. 4 Perfection Brick Press in their works to facilitate the manufacture of large paving blocks and tile. The No. 4 was made to their special order by Messrs. C. W. Raymond & Co., Dayton, O. It is a powerful press with great pressing strength and rapidity of motion. The probable weight is 2,500 lbs., estimated pressure 30 tons, capacity of 6 to 7,000 blocks per day. One is also being built we understand for the Graham Patent Artificial Stone Co. Limited, of New Orleans, La.

Mr. Jno. R. Elder, of this city, is organizing a company to manufacture the Donaldson Clay Shingle, a description of which has been given in a previous number of this journal. The company will be capitalized at $25,000 and propose to engage in this important industry on an extensive scale. Their factory will be located near this city and the clay shipped from an adjoining county over the I. D. & W. Railroad, where there is an unlimited quantity almost of the finest clays of all kinds.

R. B. Morrison & Co., of Rome, Ga., proprietors of Morrison's Improved Kiln, report that their present trade in kilns as well as the future outlook is better than at any other time since their kilns have been introduced in the market. The following firms have purchased rights and some are erecting, others will erect as soon as weather will permit, a full set of Morrison's Kilns: I. C. Wheeler, of Carthage, Mo.; Connett Bros., of St. Joseph, Mo.; The Perkiman Brick Co., of Norristown Penn.; A. T. Keely, of Royer's Ford, Penn., South Baltimore Brick Co., of Baltimore, Md.; W. C. Green Brick Co., Wichita, Kan.; Knoxville Brick Co., of Knoxville, Tenn.; Tallahassee Brick Co., of Tallahassee, Fla. Mr. John B. Morrison represents this firm in the Southwest and is meeting with success, among the brickmakers in that section.

The Lion Pressed Brick Co., of St. Louis, Mo., has been organized. They will use the Lion Brick Press made by the St. Louis Iron & Machine Works, a cut of which may be seen on page 146.

The brick interests at Cleveland, O., are very promising. There are 40 yards with an average capacity of two million brick each. At present the price of good brick is $7 a thousand. Many new buildings are planned and a lively boom is expected.

The Corning Brick Co., of St. Paul, are very busy and crowded with orders for their Hollow Brick. Have not shut down a single day for ten months and have orders to keep them running for several months yet. They are using a Penfield No. 10 Machine and Pug Mill which seems especially adapted to their work.

Adam J. Weckler one of the oldest and largest Brick Makers of Chicago is largely increasing his facilities for 1889 by putting in one of Penfield's No. 20 machines, granulator, pug mill, and corrugated clay crusher. His capacity for 1889 will be 250 M. per day.

The Link Belt Machinery Co.,

New York, }
Minneapolis. }

CHICAGO, ILL.,
11 to 23 South Jefferson St.

BURR & DODGE,
Philadelphia.

MAKE

ENDLESS TROUGH CONVEYORS,
Adapted to handling (on incline) clay direct from clay-bank, or pit.

METALLIC APRON CONVEYORS,
(Sometimes called clay elevators). Adapted to feed Brick or Tile Machine.

TILE ELEVATORS, (New Pattern),
Will elevate any size up to 18-inch. Send for Prices.

LINK BELT ELEVATORS (using buckets),
Will elevate Semi-Dry or Pulverized clay.

We are prepared to contract for the entire machinery required for a Complete Brick or Tile Works of any capacity.

Send for 1888 Catalogue.

(Mention the Clay-Worker.)

A. Potts & Co. of this city are having a busy season. They have recently booked orders for one horizontal brick machine for St. Paul, Minn., and one for New Jersey, four mould sanders to Helena, Montana, two to Portland, Oregon, one to Memphis, Tenn., and one to St. Paul. They are also shipping a large number of their disintegrators, five going recently to one firm at Atlanta, Ga.

We have received a copy of D. J. C. Arnold's new catalogue of Brickmakers' Supplies, including Brick Moulds, both hand and machine, Tempering Wheels, Pallets, Barrows and Trucks of all kinds, Kiln Doors, Etc., Etc. It is neat and tastefully arranged and should find a place in the office of every brick yard. Send for a copy, addressing D. J. C Arnold, New London, O.

The Eureka Brick Machine M'f'g Co., of St. Louis write us that the Eureka is still growing in favor and that their trade is increasing handsomely. Their orders are ahead of any previous year, and they are much gratified with the prospects of a prosperous season. They invite brickmakers visiting St. Louis to call on them at their new quarters in the Laclede Building.

THE Jos. J. Kulage Press Brick Machines Patented 1884, 1886, 1888.

Yield DOUBLE the Pressure of any other Brick Press (excepting the "Hydraulic") and are marvels of perfection.

A NEW ERA IN MAKING PRESS BRICK.

EVERY BRICK MANUFACTURER who intends or is making "Dry" or "Semi-Dry" Pressed Brick neglects his interests, if he fails to visit or correspond with the undersigned in regards to his system and machines. Works in operation day and night, all year (excepting December and January). Capacity: Daily 140,000 Bricks.

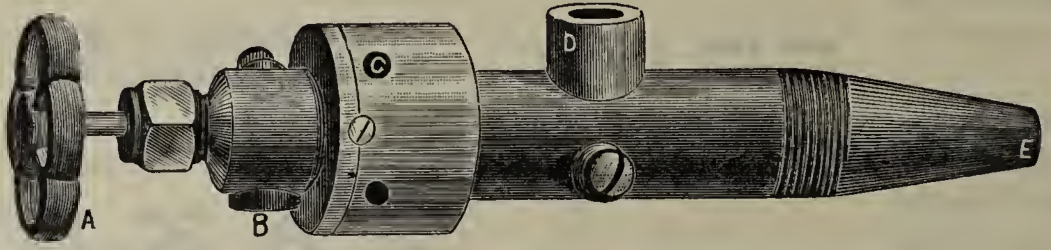
Our Fancy, Front and Stock Bricks are the only DRY-PRESSED Bricks made in the United States that are equal and SUPERIOR to those of the St. Louis "Hydraulic". We want a reliable Representative for the sale of our bricks in every large city.

JOS. J. KULAGE, President
College Hill Press Brick Works,

WORKS, near O'Fallon Park St. Louis, Mo.
OFFICE, 1435 College Avenue, ST. LOUIS.

"A Dollar Saved is a Dollar Earned."

The latest development in the economical use of fuel for burning Brick, Tile, Terra Cotta, Sewer Pipe, Pottery, and for every other purpose requiring heat or steam.



REID OIL BURNER CO.,

Patentees and Manufacturers of

REID HYDRO-CARBON OIL BURNER.

158 PUBLIC SQUARE,
Cleveland, Ohio.

GEORGE BURNHAM & SONS' BRICK WORKS,
MILWAUKEE, WIS.

Reid Oil Burner Co.:

Yours of the 13th inst. received in regard to the Reid Burner. We have tried the different makes of oil burners offered on the market in our section, and can safely recommend the Reid as being the most suitable for burning brick that we have tried. We will have the fifty burners we purchased of you in operation next week, in burning the fourth kiln we have tried with your burner.

Yours respectfully, GEORGE BURNHAM & SONS.

J. B. LEGNARD, BRICK MANUFACTURERS,
CHICAGO, ILL.

Reid Oil Burner Co.:

Enclosed please find check on account burners. I have been experimenting with oil for the past three months and during that time have used two other makes of burners, and have decided to adopt yours. My arrangement with you was to take forty burners if the twenty which I have proved satisfactory. Please send the other twenty at once. Very truly yours,

J. B. LEGNARD.

SEND FOR CATALOGUE.

E. E. BILLOW, Agent, Room 64 Rookery Building, CHICAGO.
JOSEPH REID, Agent and Manufacturer, OIL CITY, PA.

THE AERATED FUEL COMPANY'S SYSTEM.

[Patented in the U. S. and in Foreign Countries].

POTTERY, BRICK AND LIME BURNING BY PETROLEUM AIR BLAST.

The only Rival of Natural Gas. *Cheaper than Coal or Wood.*

A fire can be maintained indefinitely at a low heat, or increased to any required degree by merely turning a stop-cock.

OUR SYSTEM CAN BE ADAPTED TO KILNS NOW IN USE. No expensive plant needed. DO NOT CONFOUND THIS SYSTEM WITH ANY OF THE STEAM JET OIL BURNERS. The Insurance Companies approve our system. Nothing but air and Lima crude oil used in the fire.

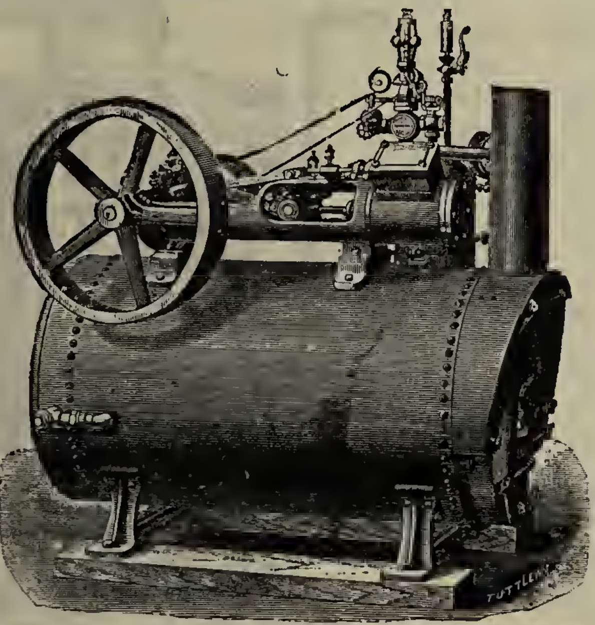
W. S. COLLINS,
Sole Licensee for Middle Atlantic States,
[Mention the Clay-Worker.] 171 Broadway, NEW YORK.

+STEAM + ENGINES!+

Upright and Horizontal,
Stationary, Portable, and Semi-Portable.

All sizes, from Three to Twenty-six Horse-Power. Compact, Substantial, Economical and Easily managed. Guaranteed to Work Well and give the Full Power Claimed. Over 4,000 in Successful Operation. Not One Ever Exploded. No Engine Built so Well and so Low in Price. Illustrated Pamphlet Free. Address,

JAMES LEFFEL & CO.,
Springfield, Ohio,
Or No. 110 Liberty St., New York City.



SOLE MANUFACTURERS.

Main Belting Co.,
Manufacturers of the Celebrated

Leviathan Belting!

WHICH FOR
Strength and Traction Power
HAS NO EQUAL.
Specially adapted for Brick and Tile Machinery.
Unaffected by Heat, Steam or Dampness.

Send for Price List.
Samples sent on application.
Mention this paper.
FACTORY AT PHILADELPHIA.
Address,

Main Belting Co.,
248 Randolph Street, CHICAGO, ILLS.

NOTE—To any responsible party sending us measures, we will ship a "Leviathan" Belt on sixty days trial; to be paid for if satisfactory.

NEW ADVERTISEMENTS.

Davidson Steam Pump Co.,
  Pumps and Boilers.
Grand Automatic Brick Mach. Mfg. Co.,
  Brick Machinery.
Chambers Bros. Co.,
  Brick Yard Supplies.
Wallace Manufacturing Co.,
  Clay Working Machinery.
Jonathan Creagers' Sons,
  Brick Machinery.
The Frey, Sheckler Co.,
  Brick and Tile Machinery.
Tiffin Agricultural Works,
  Brick Machinery.
Newell Universal Mill Co.,
  Clay Pulverizers.
J. W. Penfield & Son,
  Clay Working Machinery.
D. J. C. Arnold,
  New London, Ohio.
W. B. Mershon & Co.,
  Brick Pallets, Etc.
Michigan Brick & Tile Machine Co.,
  Brick and Tile Machinery.
William Thaison,
  Brick Press.
Jas. Leffel & Co.,
  Steam Engines.
W. S. Collins,
  Aerated Fuel System.
J. J. Kulage,
  Press Brick Machine.
Reid Oil Burner Co.,
  Oil Purner.
Small Ads., Wanted, For Sale, Etc.

NEW INVENTIONS.

The following is a list of patents appertaining to brick, tile, terra cotta, sewer pipe, pottery, etc., and the machinery used in their manufacture issued since our last number: (A copy of any of them can be obtained by sending 25 cents, the official price, to Chas. E. Brock, Patent Attorney, 925 F St. Washington, D. C.)

397,247. Mold Sanding Machine—C. Potts, Indianapolis, Ind.
397,665. Brick Kiln—Shakespeare & Rose, Chester, Penn.
397,604. Brick Machine—J. Morhand, San Francisco, Cal.
397,730. Hydraulic Brick Machine—J. Koch, St. Louis, Mo.
397,660. Brick Press—J. H. Steele, Butte City, Montana Ter.
397,642. Kiln for Firing Decorated China, Etc.—F. E. Hall, Catskill, N. Y.
397,770. Tile Machine—H. Z. Young, Seville, Fla.
398,134. Brick Machine—C. & E. Doerfler, Springfield, Ill.
398,055. Pavement—J. Kuoche, San Jose, Cal.
397,997. Tile Ditching Machine—R. E. Nevin, Enon Valley, Penn.
390,568. Molding Machine—J. Baker, Andover, N. H.
398,373. Machine for Tempering Clay—J. & M. Bierline, Chaska, Minn.
398,704. Molding Machine—T. A. Considine, Chicago, Ill.
398,730. Glass Tile—Izard & Stange, Glassborough, N. J.
398,420. Paving Composition—McCaughey, Sioux City, Ia.

A FINE PICTURE.

Our sanctum is now decorated with a handsome chromo, illustrating a chariot race as conducted by the Romans of old. Those who have read "Ben Hur" and enjoyed the thrilling description of a similar scene will be especially pleased with it. A copy may be secured by any of our readers free by addressing J. W. Penfield & Son, Willoughby, Ohio.

OHIO TILE, BRICK AND DRAINAGE ASSOCIATION.

The Ohio Tile, Brick and Drainage Association held their annual meeting at Columbus, February 12th and 13th. The attendance was as good as at former meetings and a lively interest manifested in clay working. The sales of tile have been much better in the past two or three months and the outlook is considered good. There are a few exceptions and always will be, we suppose. But the general trade is improving.

The brick interest the past year has been lively, demand good and prices very satisfactory. Many tile manufacturers have gone into the brick business as well. They express themselves as much plessed in uniting the two.

The cutting in prices in the sale of tile has had the effect to discourage the output, and many factories are cutting down the output to meet the demands of the trade, only, at fair prices.

It was quite apparent that there is a stiffening of the spinal column in the way of a determination to sell only at remunerative prices.

The use of brick for street paving received a full share of consideration, and was highly commended. Several cities in this state have been putting down miles of brick pavement and after several years of wear find it very satisfactory indeed. So that we confidently predict that it is the pavement of the future in that country.

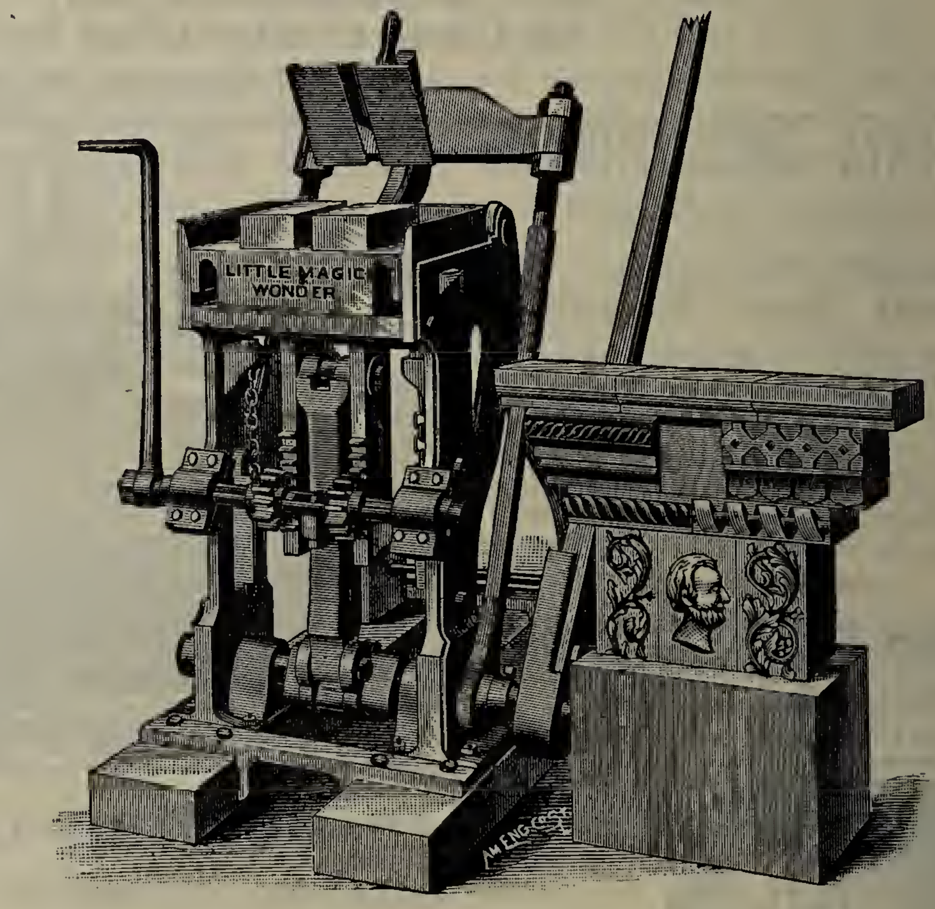
The officers elect for the ensuing year are: President, W. A. Eudaly, Cincinnai; Vice-President, R. E. Farnham, Richfield; Secretary, D.C.Postle,Galloway; Treasurer, S. E. Hagy, Etna, O. Programme Committee: D. C. Postle, S. E. Hagy, and Mr. Horlocker.

S. A. Yeargin, of Ousley, Ga., thinks there is a fine opening in his neighborhood for the establishment of a brick and tile plant. He writes that there is an abundance of excellent clay and that a good business can be established. Write him for particulars.

THE LITTLE MAGIC WONDER.

It Will Do It!

OVER 1,000 DIFFERENT PATTERNS OF ORNAMENTAL BRICKS CAN BE MADE ON THIS WONDERFUL PRESS.



Hear What a Prominent Brickmaker Says:

St. Louis, Feb. 3d, 1889.

Mr. Wm. Thaison, Austin, Texas:

DEAR SIR—At the end of a fair and satisfactory trial of your Little Magic Wonder Dry Clay Hand Brick Press, it affords me great pleasure to testify to its efficiency for the purpose intended. I had long been looking for just such a Press, whereon at short notice and at very slight expense we could, within a few hours' time get out small orders for ornamental bricks of special designs and patterns without interfering with the operation and working of our regular machines. The great value of your Hand Press to me, lies in the fact that we can make bricks upon it by pressure on edge as well as flat wise, thus enabling one to make almost any conceivable design of fancy moulded ornamental bricks. As you let your machines go out on trial there can come no loss to parties intending to purchase. Very Respectfully, ANTHONY ITTNER.

Mr. Ittner runs two of these machines. His reputation as a gentleman and an expert brickmaker is so well and favorably known to the readers of the Clay-Worker that further comment is unnecessary.

Address

WM. THAISON,
Austin, Texas.

Catalogues will be sent only upon mention of this paper.

STANDARD EIGHT-FOOT DRY GRINDING PAN

For Fire Clay, Red Brick Clay, Limestone and Lime, Sand and Other Refractory Materials.

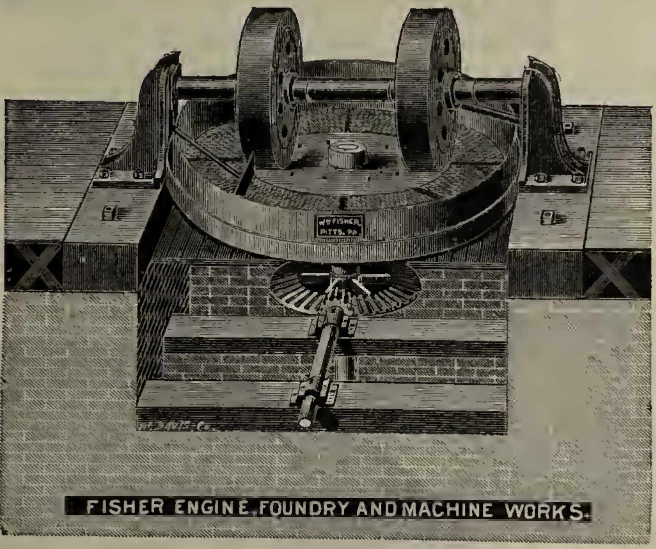
DESCRIPTION.

This Pan is undergeared and will grind Fire or Red Clay for 20,000 brick in ten hours.

The Rolls weigh 5,000 lbs. each.

We make this Pan in different sizes, from 5 feet to 9 feet in diameter.

We also make them with iron frames and or wood frames for overhead gear.


FISHER ENGINE FOUNDRY AND MACHINE WORKS.
WM FISHER PITTS. PA.

WE ALSO MANUFACTURE

Wet Grinding Pans from 5 to 12 ft. in diameter.
Stationary or revolving Pans.
Glass House Pans.
Pug Mills with Iron Boxes.
Brick Presses. Press Boxes.
Brick Molds. Tile Presses. Engines. Gearing.
Blake Crushers and Special Machinery.

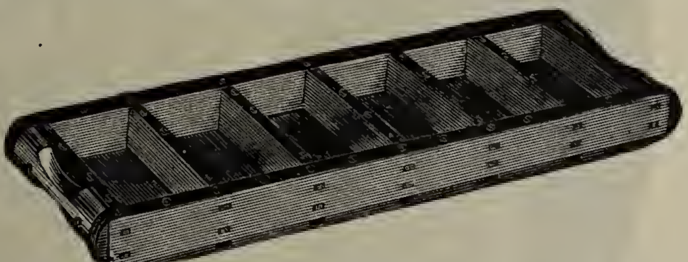
WM. FISHER, Proprietor,

23d, 24th and Smallman Sts., PITTSBURGH, PENN.

G. COLDEWE & CO.,

—MANUFACTURERS OF ALL KINDS AND SHAPES OF—

HAND AND MACHINE MOULDS.



We manufacture the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

:o:

☞Sample Moulds sent to any place in the United States free of charge. Send for Circular.

No. 829 Sixth Street, Milwaukee, Wis.

☞Mention the CLAY-WORKER.

ELEVATORS FOR CLAY, COAL, ORES, SAND, GRAIN, ETC.

SECTION OF CONVEYOR.

ELEVATORS FOR TILE, BRICK, PACKAGES, &C.

Roller & Detachable

CHAIN BELTING,

Designed for

Elevators,

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Drive Belts,

—For Handling—

BRICK, CLAY, TILE, COAL, ORES, ETC.

Estimates for handling material of any kind cheerfully furnished. For '88 Catalogue and prices

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The Jeffrey Manufacturing Co.,

112 East First Avenue,
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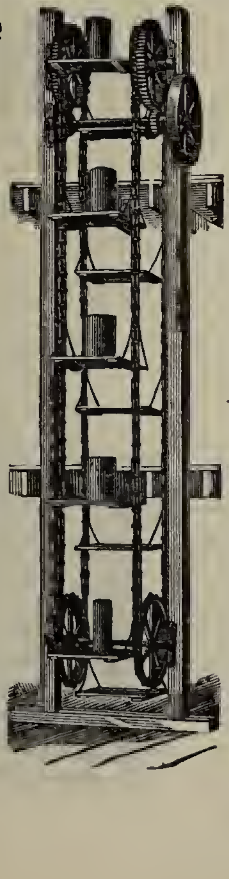


FOR SALE, WANTED, ETC.

☞ADVERTISING RATES in this column teree cents a word each insertion.

FOR SALE. Six (6) mule trucks for sale cheap.
STANDARD BRICK CO.,
3 1 d. Milwaukee, Wis.

FOR SALE. One-half Interest in my brick plant. For particulars address A. V. MCKIM,
1. 2. d 13 E. Levee, Kansas City, Mo.

FOR SALE. One Sword and Son Brick Machine, in good order; has been run three seasons. Will sell for $150. C. AMMAN,
1. 3. d. Decatur, Ill.

WANTED. One Dry Pan suited to grinding cinders, bats, broken tile, etc. State price, condition, size and capacity. STREATOR TILE WORKS,
3 1 d. Streator, Illinois.

WANTED. Position by an experienced hand, as burner or setter, at reasonable wages. Address
A. E. HENRY.
2 .. c. (Box 955) Nebraska City, Neb.

WANTED. To correspond with reliable party experienced in the manufacture of terra cotta and competen to take charge of works to be erected soon.
J. R. HILL,
3 1 c. Asheville, N. C.

CLAY GIVEN AWAY. Immense beds suitable for paving brick, pressed brick and fire brick.
Address JAY BAKER & CO.,
3 4 d. Streator, Ills.

FOR SALE CHEAP. 1 Adrian No. 2 Tile Machine 1 Hoosier No. 5 Tile Mill; 1 Hockett Steam Geared Mill. 1 Wallace Crusher large size, 3 horsepower tile mills. All good as new and cheap. Address
A. BROWN, JR.,
12. tf. Portland, Jay Co., Ind.

WANTED. A first-class red brick burner one with experience in the successful burning of brick with crude oil. Address with full particulars,
SPA SPRING BRICK CO.,
3 tf d. Woodbrigde, New Jersey.

FOR SALE. One Tempering Wheel, gears and shaft complete for steam. One Bennett Tile Machine. One Penfield Tile Machie No. 4. Address
W. E. HINCHLIFF & CO.,
3 1 d. Room 3, 159 LaSalle St. Chicago. Ill.

FOR SALE. One new Forty (40) inch latest improved Stedman Clay Pulverizer. For particulars address SARGENT & VANZANDT,
1. tf. d Fort Worth, Texas.

WANTED, a partner in an established brickyard. This is a good chance for the right man. Must have from $3,000 to $5,000. A young man preferred.
Address, P. O. Box 497,
1. 3 1p. Omaha, Neb.

FOR SALE. Bed of terra cotta clay, conveniently located to Kansas City, Mo.; on railroad; good site on ground for any size plant. For particulars address, W. C. LEMON,
2. 1. c. Liberty, Mo.

FOR SALE. One Whittaker Semi-dry Brick Machine; one Steadman Pulverizer; one Bucket Elevator; all in good order, having made only about 600,000 brick. J. M. HARRY & CO.,
2. 6. 5p. Dallas, Tex.

FOR SALE CHEAP. The whole or two-thirds interest in the Morrison Brick and Tile Works; 30 H. P. Engine and Boiler; only factory in county; a lively town of 3.000. M. L. WEAVER,
2. 2. d. Morrison, Ills.

FOR SALE. One Hoosier Auger Mill No. 5, in excellent condition, with dies for 3½ to 12 inches. My only reason for offering it for sale is that I wish to make larger tile than 12-inch. The outfit will be sold at a bargain. Address M. J. LEE,
2. tf. d. t.j. Crawfordsville, Ind.

WANTED. Situation as manager by a thoroughly practical man having experience in making, drying and burning of bricks by improved methods.
Address BRIX,
3 2 c. Care of Clay-Worker.☜

FOR SALE CHEAP. One 75 horsepower steam engine in a No. 1 order. Suitable for brickyard use. CHAMBERS BROTHERS COMPANY,
3 1 d. Philadelphia, Pa.

WANTED. By two brickmakers of experience, the contract to make brick by the thousand. Reference given. Address OSCAR SUSKIND,
3 2 c. 110 South Center St., Schnectady, N Y.

WANTED. A foreman on a steampower brickyard Must understand well the making of repressed brick and burning. Address
ST. JOSEPH PRESSED BRICK CO.,
3 1 c. St. Joseph, Mo.

WANTED. By an experienced pipe or brickmaker, situation as working foreman. Acquainted with Vaughn and Barber machines. Economical handling of men and machinery. A fair knowledge of burning. Best of reference. Address W. A.,
3 1 1 p. Care Clay-Worker.

Continued on next page.

WANTED. A good second hand Penfield No. 7 Special Tile Machine. Address stating price, etc., to ANDERSON & KENWARD,
3 1 p 2. Roberts, Ills.

FOR SALE. 1 horsepower Quaker Machine, only used about 2 months; in good order. We sell on account of using steampower. Will sell cheap.
3 2 d. AMENIA BRICK CO., Amenia, N. Y.

WANTED. A situation as Superintendent by A. H. Doty, until recently proprietor of the Continental Brick Yard at Hartford, Conn. 25 years' experience in the business. Address A. H. DOTY,
3 1 d. 78 Barbour St., Hartford, Conn.

FOR SALE. A 26-inch 'Newell Grinder.' Having changed our process of manufacturing brick, we offer at less than half price a 26-inch Newell Universal Mill. This Mill is of the improved pattern, was purchased new last summer and is guaranteed to be in first-class condition. THOS. H. SILVER,
3 1 d. Wellsville, Ohio.

WANTED. An experienced Pottery man with capital to take an interest in the Nashville Pottery and superintend the same. None but a competent man wanted. Address
NASHVILLE POTTERY CO.,
3 1 d. Nashville, Tenn.

FOR SALE. One 10x20 engine complete, rebuilt good as new. One set of Hercules Clay Rolls. The above will be delivered F. O. B. cars for a very little cash. MILTON WILLIAMS & CO.,
3 1 d. 1417 N. Second Street, St. Louis, Mo.

WANTED. Superintendent for the Austin Pressed Brick Company (Austin, Minn.), who thoroughly understands the making and burning of fine pressed brick. Address G. SCHLEUDER,
2 1 c. Austin, Minn.

SUPERINTENDENT WANTED. Competent to take charge of an old established fire brick and drain pipe works. Must be thoroughly acquainted with all details. One familiar with New Jersey Fire Clays preferred. Address, stating experience, salary expected and references. H. M. K.,
3 1 c. P. O. Box 1692, New York City.

WANTED. A position as superintendent for the erection and management of brickworks; many years experience in all the practical departments of making, etc., by either the mud, plastic, or semi-dry processes thoroughly conversant with the best and and most modern machinery dryers and kilns. Would have no objection to contract. FELIX,
3 tf. t. Care Clay-Worker.

FOR SALE. We have one Vervallen h. p Brick Machine run two years, in good repair. Capacity 18 M. Will take $100. Also one Wallace Crusher, run one season; all complete; tight and loose pulley; will take $100. All loaded on cars if sold
C. J. HOLMAN & BRO.,
1 tf d. Sargent's Bluff, Ia.

WANTED. A partner to engage in the manufacture of encaustic tiling, ornamental and fire bricks, mineral paints, etc. The advertiser is the owner of lands containing a fine quality of kaolin; yellow, brown and gray ochres. Those meaning business, address G, care Box 266,
3 1 d. Jackson, Mo.

FOR SALE. One Centennial Tile Mill with dies up to 18 inches; almost good as new. Also one Brewer Crusher, Stone Separator and tapered rolls. One Wallace Crusher and Stone Separator. One Penfield No. 7 Mill, dies up to 10 inches. Address
GEO. W. KAUFMAN,
3 1 1 p. London, Ohio.

FOR SALE. A tile factory containing 3 kilns, large shed 32x100; four floors heated by steam pipes and heat from the kilns. Good machinery. 6 acres of ground. Demand for tile equal to twice the supply and at good prices. Located in county seat. A capital chance to invest; am running all the time. No stock on hand. Address P. O. Box 246,
3 1 1 p. London, Ohio.

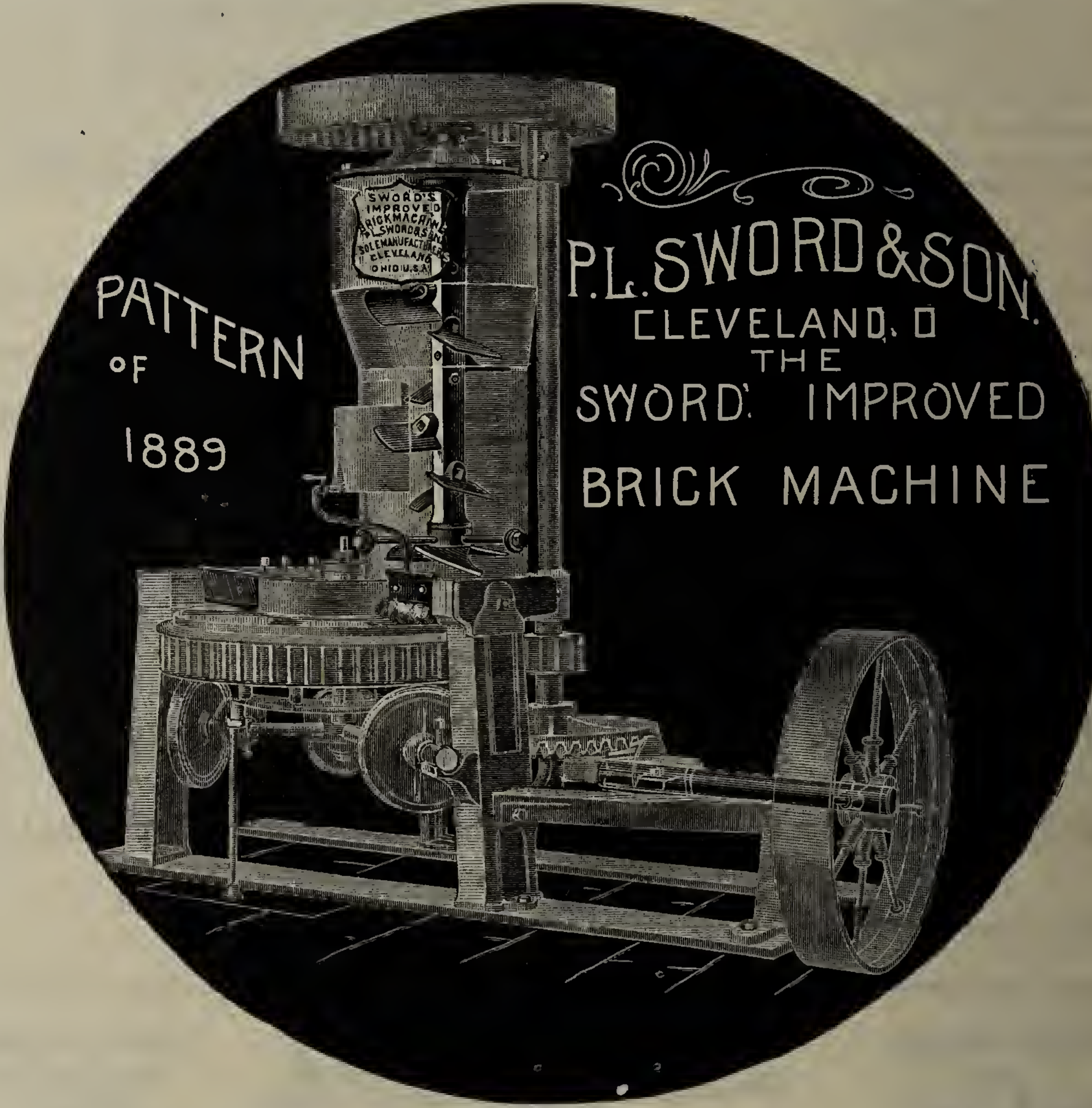
WANTED. An experienced brick man to act as foreman of a yard working a steam dryer, continuous kiln and turning out 50,000 brick per day. Must be thoroughly posted in all branches of brickmaking from tempering the clay to loading the finished brick on the cars. A good place for the right man. References required. Yards thirty miles from St. Paul, Minn.
Address C. A. HAWKS,
3 1 d. 174 West 7th St., St. Paul, Minn.

FOR SALE. Two Pug Mills, one Chambers Compound Rolls, new, cost $1,200, will sell for $500; 9,000 Chambers Pallets, cost 70 cents, will sell for 25 cents, as good as new; 17 Drying Tunnels; 3 Transfer and 3 Dump Cars; large amount of belting, shafting and pulleys; all the above as good as new. Apply to
C. E. EHLERT.
2. tf. d. Room 1, 167 Dearborn St., Chicago, Ills.

FOR SALE. A well equipped brick plant at Hastings, the third city in Nebraska; 5 acres of good land situated within corporate limits, side track to kilns; 25 feet clay sand underlaying. New Quaker Machine; 230 feet of dry house 24 feet wide; 3 good kiln clamps, 20 inch walls; 10, 11 and 12 arches. Two good large barns, two good houses; two wells with tanks and windmills and all necessary lumber and tools to make 2,500,000 per season. No better market in the northwest. This plant cleared $7,500 in 1888. Will be sold cheap for cash. Write for terms. Good satisfactory reasons for selling. S. N. COLLINS,
3 1 d. P. O. Box 832, Hastings, Neb.

WILLIAMS' Cyclone Pulverizers, 36, 40 and 48-in. diameter.
WILLIAMS' Revolving Clay Screens.
WILLIAMS' Automatic Feeders and Mixers for Dry Presses.
WILLIAMS' Grinding Tables for Sizing Brick.
WILLIAMS' Clay Elevators.
WILLIAMS' Clay Conveyors.
WILLIAMS' Brick Trucks.
WILLIAMS' Clutch Pulleys for Stopping and Starting.
WILLIAMS' Friction Couplings.

Write to **MILTON F. WILLIAMS & CO.,**
1417 and 1419 N. 2nd St., St. Louis, Mo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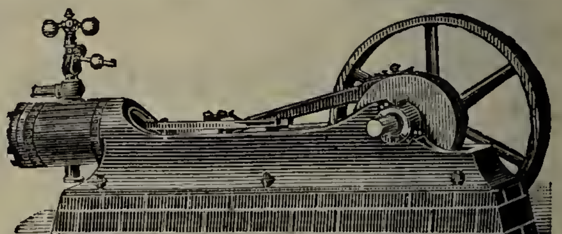

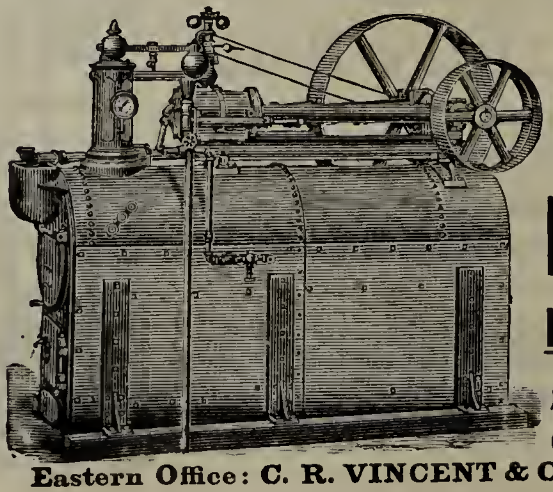

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MORE THAN 3200 IN USE.

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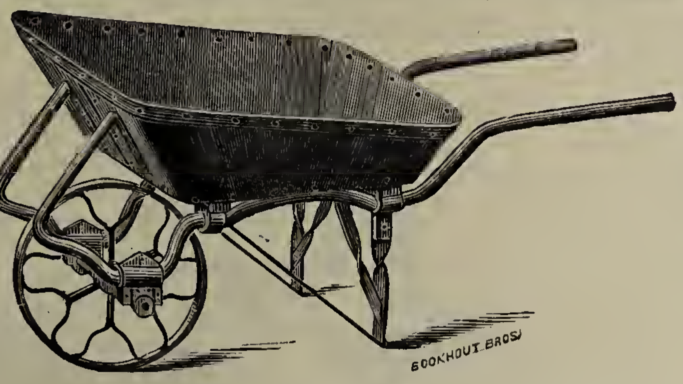
The National Barrow and Truck Co.,

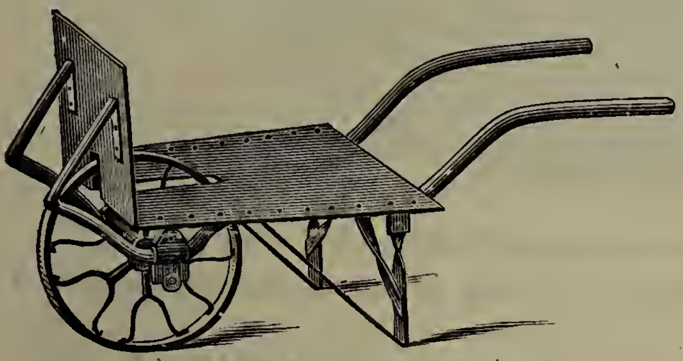
82 and 84 Fulton St., New York City.


BOOKHOUT BROS.

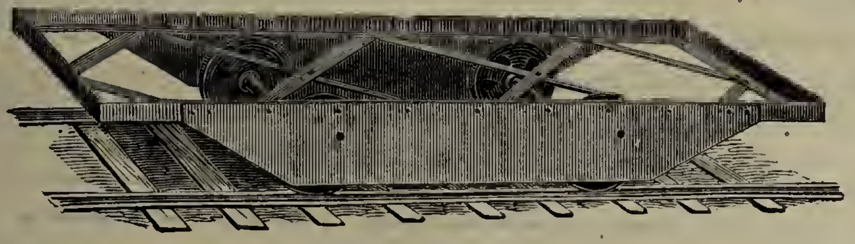
Manufacturers of Steel Wheel Barrows for handling Sand, Clay, Brick, Coal, Etc.

Also manufacturers of the Fitch Steel Pallets, Wrought Iron and Cast Iron Brick Drying Cars a specialty.

Our Barrows are used largely by the brick manufacturers in New Jersey and along the Hudson River. For our Drying Cars we refer to the Lorillard Brick Works, Keyport, N. J., and for our Pallets to Perth Amboy Terra Cotta Works, Perth Amboy, N. J. Send for illustrated catalogue and price-list.



BARROWS FOR GREEN BRICKS.



WROUGHT IRON BRICK CARS.

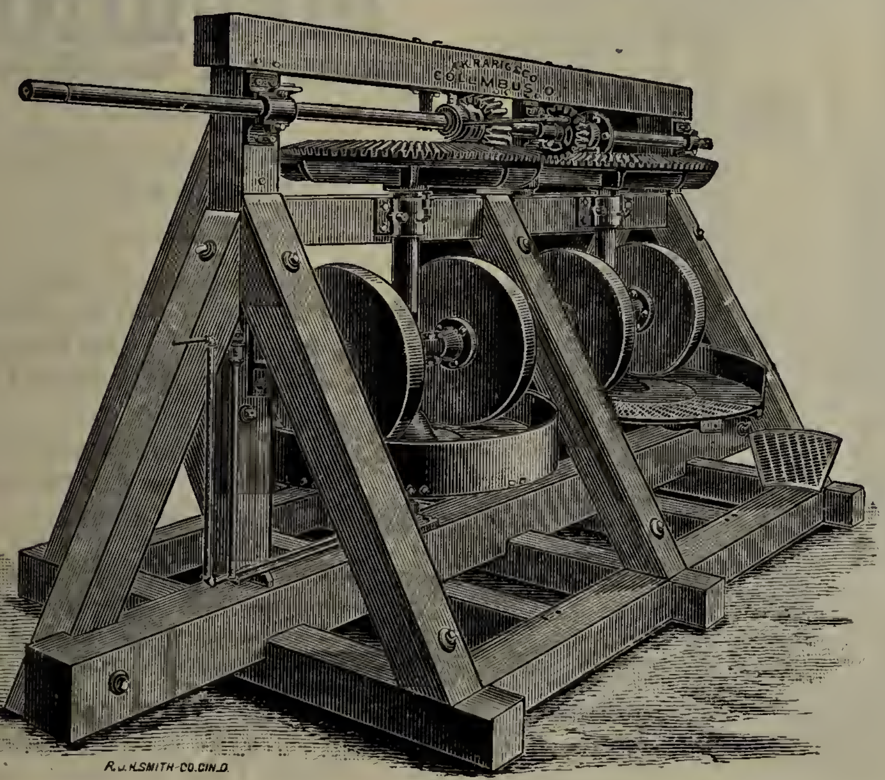
AVERY'S SEAMLESS STEEL BUCKETS FOR CLAY, ORE & ANY DAMP SUBSTANCE.

MANUFACTURED BY THE AVERY ELEVATOR BUCKET Co CLEVELAND, OHIO.

WE MAKE SEAMLESS STEEL BUCKETS FOR EVERY USE

ALEX. K. RARIG & CO.,

Founders, Machinists and Boiler Makers, Columbus, O.


A.K. RARIG & CO COLUMBUS, O
R.J.H.SMITH CO. CIN. O.

Office and Works:
Cor. Water and Chestnut Streets, near new Union Depot.

Steam Sewer Pipe and Tile Presses, Grinding and Tempering Pans, Sewer Pipe, Tile and Fire Proof Dies, etc.; Automatic Cut-off and Slide Valve Engines, Boilers, Pulleys, Hangers and Shafting, Steam Pumps, Pipe Fittings and Architectural Iron Work.

FOR SALE. A well located Tile Factory, Steam Power, with all modern improvements, having two lines of rai roads with side tracks convenient for unloading coal or shipping—surrounded by a large area of rich prairie land, a large home demand for tile with no local competition. No better location to be found. For full particulars, terms, etc., address M. J. L.,
3. tf. d. Care Clay-Worker.

FOR RENT—OR WILL TAKE A PARTNER. Brick and tile plant. One of the most desirable locations on the Hudson River for a large business in drain tile, sewer pipe or brick, either or all combined. A tract of many acres of excellent clay for brick, tile or pottery; plenty of room; good dock and 1,800 feet front on river and siding on railroad. Good houses for men, both healthy and pleasant, and many other advantages. "C,"
2. tf. 3p. Roseton, Orange Co., N.Y.

RARE OFFER. I will sell my entire brickyard outfit consisting of New Quaker extra heavy steampower brick machine. Fletcher & Thomas Spiral pug mill. 25 h.p. portable boiler Buffalo make. 20 h.p. cente crank engine, Buffalo make together with connections and belting. 12 brick molds, 5 double spring trucks, 12,000 lath brick pallets. All new last spring; used two months. All in first class order. Cause for selling—no clay. Will sell very cheap and on reasonable terms. Address at once, G. M. COLE,
3 1 2 p. Lincolnville, Crawford Co., Pa.

FOR SALE OR RENT. Owing to other business engagements I will sell or lease on favorable terms, one Steam Brickyard of 2,000,000 capacity; also one Horse-power yard, 1,000,000 capacity, with machinery, tools sheds, and kilns complete in both yards, located on a river. near the fast-growing cities of Superior, Wis., and Duluth, Minn.; quality of briek good; clay supply unlimited; market unsurpassed in price and demand. A rare opportunity for a man with experience and some capital. No other should apply.
GEO. S. BROOKS,
2. 4. d. Superior, Wis.

FOR SALE—"Automatic." We notice in January number of Clay-Worker the ad. of W. D. Gatchel, of Louisville, Ky., offering an "Automatic" Brick Machine and Pug Mill for $125. In justice to ourselves and the reputation of our Automatic we humbly state that the machine in question is originally a Martin machine of the earliest pattern; it was purchased second.hand from D. C. Tuder, of Covington, Ky., in 1885, and Mr. Tudor in turn purchased it from some point in Kentucky. We remodeled it by building a new frame, and placing an Automatic relief lever on side. That much of it is "Automatic" and no more.
JONATHAN GREAGER'S SONS,
Cincinnati, O.
Feb. 5th, 1889.
2. 2. d.

THE MONTSERRAT MINING AND MANUFACTURING COMPANY owns 2000 acres of valuable mining lands in Johnson Co. Mo., on the main line of the Missouri Pacific Railway 70 miles east of Kansas City and 20 miles west of Sedalia. These lands are underlaid with nine veins of coal and ten beds of clay each from 5 to 20 feet thick.

It is the most remarkable deposit of clay in the United States, including the most refractory fire clays as well as the finest quality of potters' clays and a bed of white sand which is a mixture of free silica and free alumina. At the bottom of the coal measures is a thick bed of black carbonate ore 46.20 per cent. iron, free from sulphur and phosphorus.

This Company has been mining the coal, clay and ore for years on an extensive scale and the property has been thoroughly explored. The Company has erected a large plant on the property for the manufacture of brick, tile and terra cotta lumber.

An experienced and competent man is wanted to superintend the brick work. A suitable man who will put in some of his own money to show his faith can get a splendid deal from this Company.

The superior quality of vitrified Fire Clay Paving Brick made by this Company has gained such a reputation there is no limit to the demand for them.

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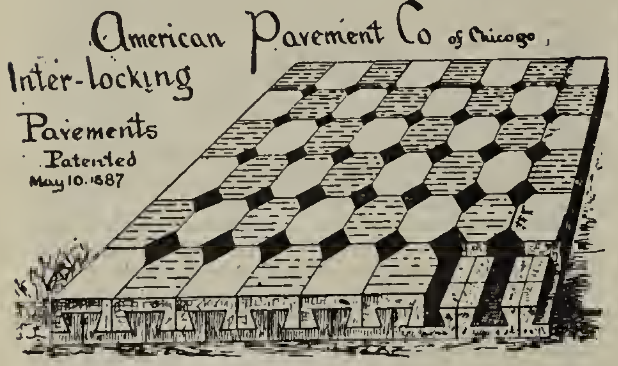

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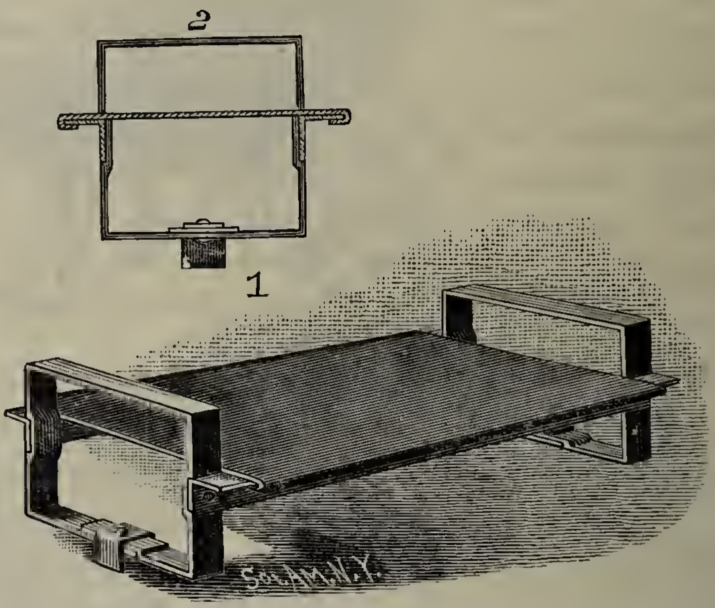

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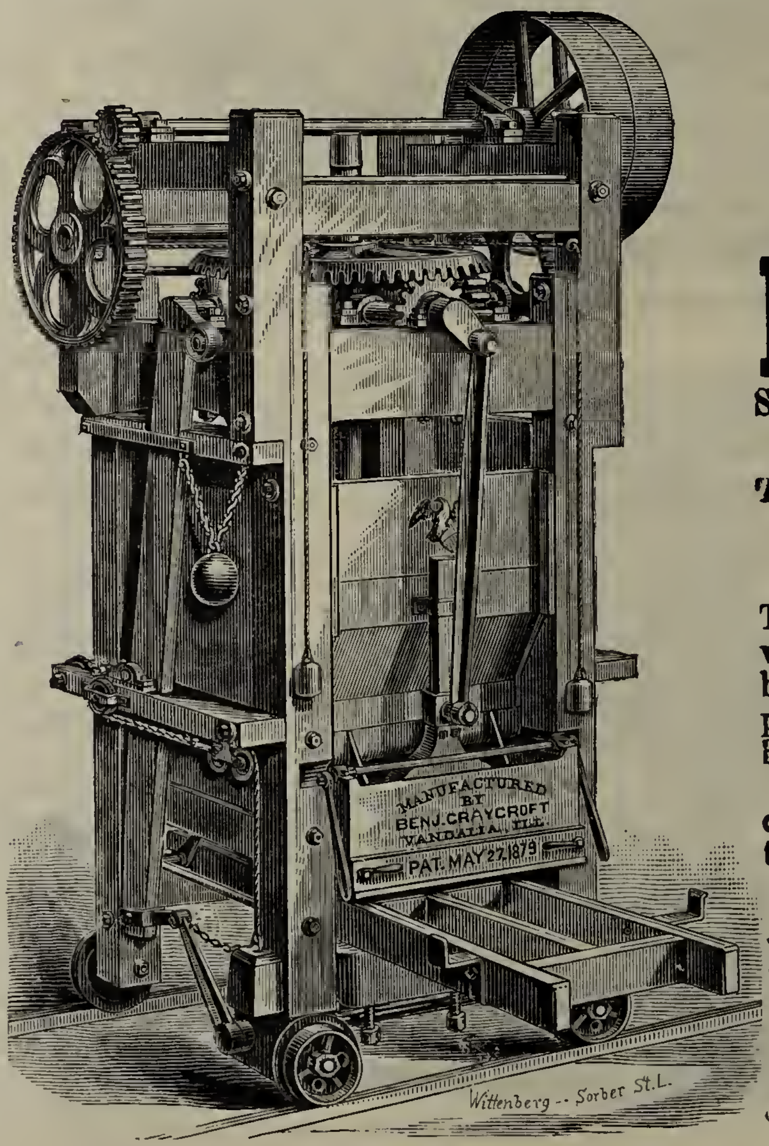
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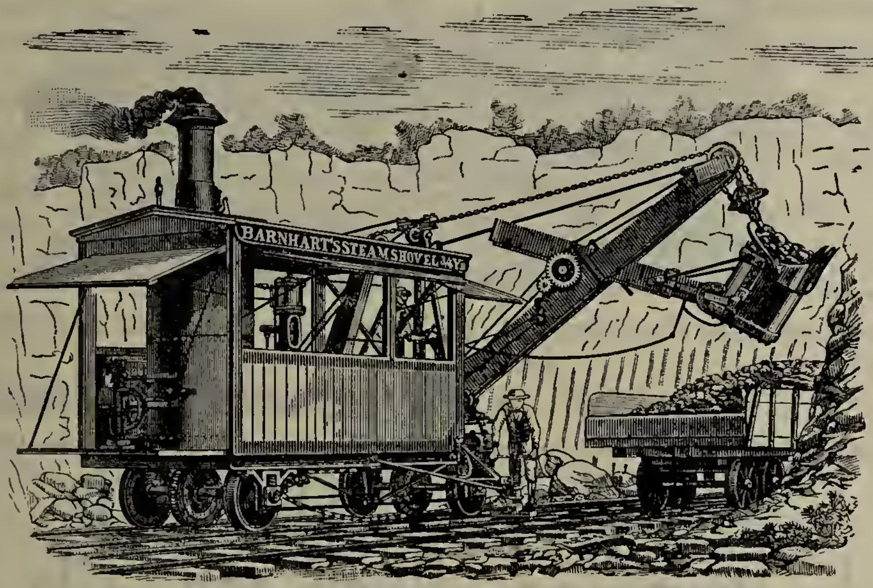
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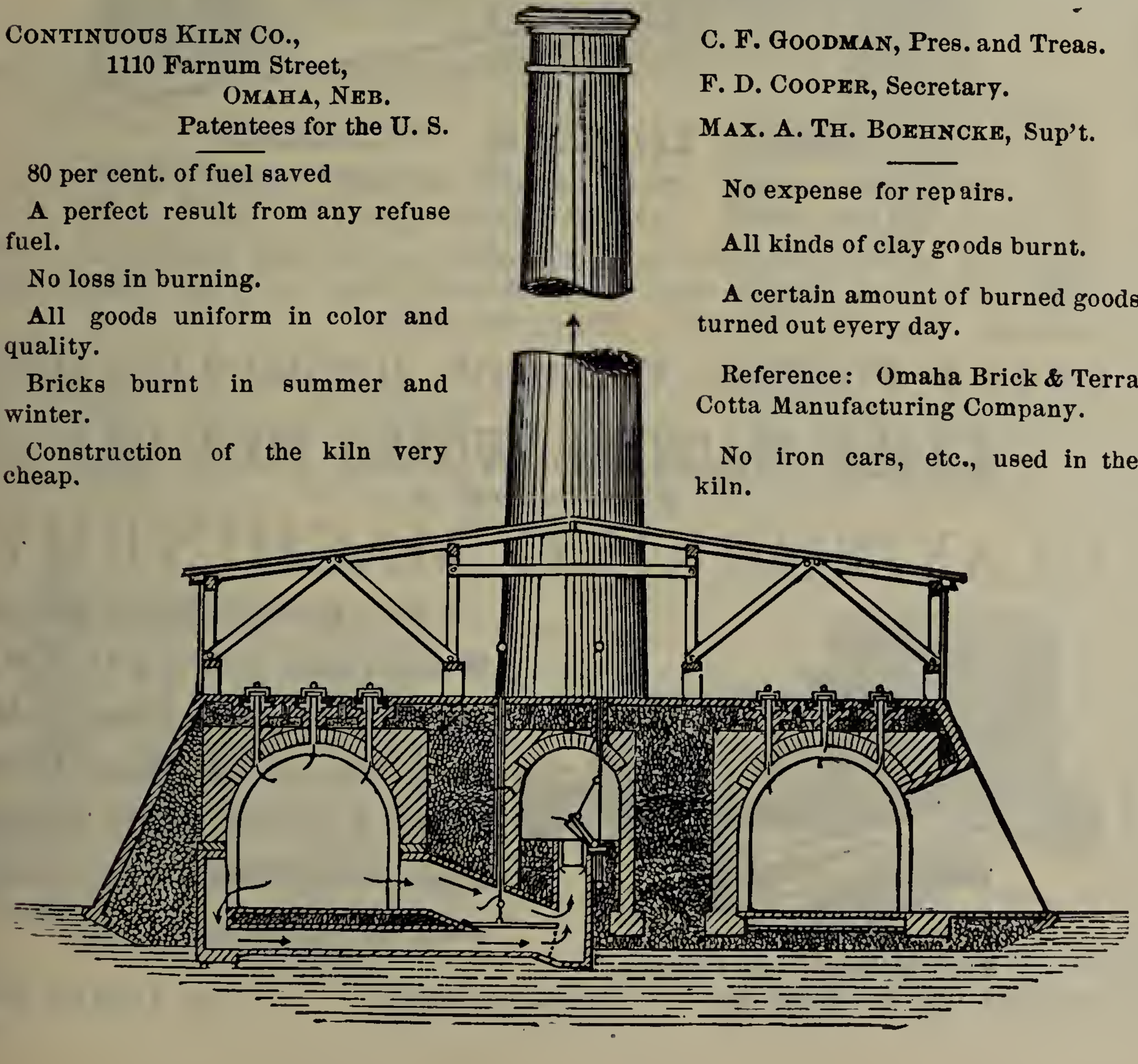

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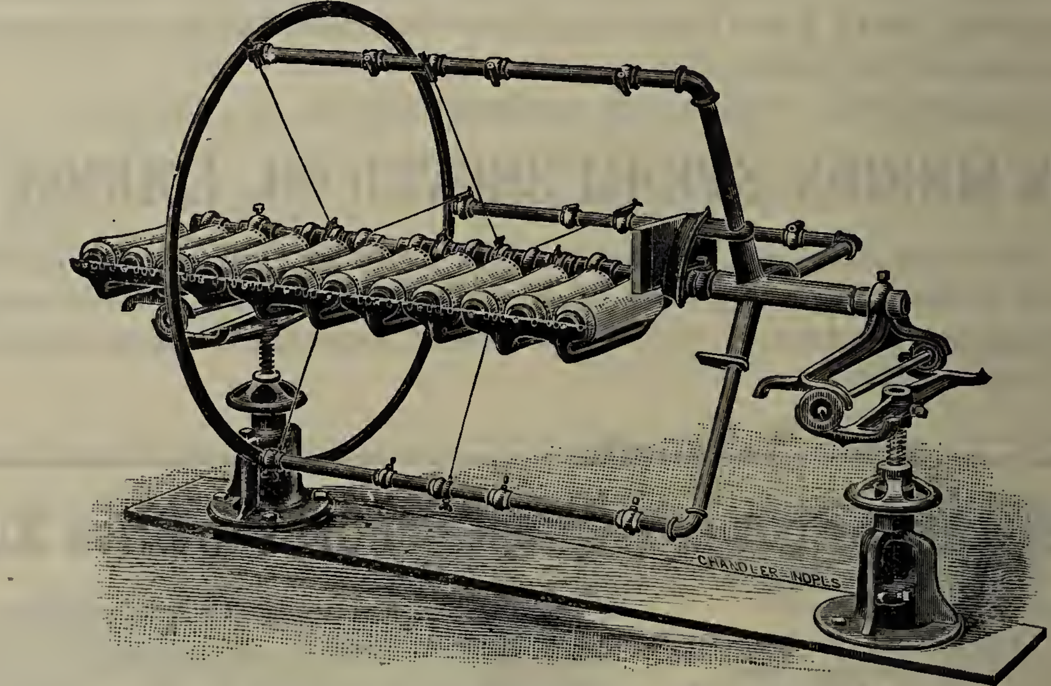

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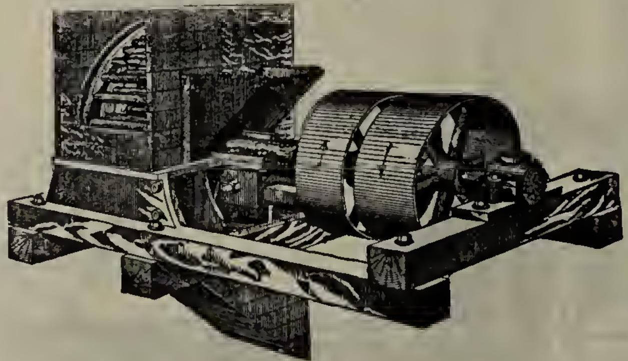

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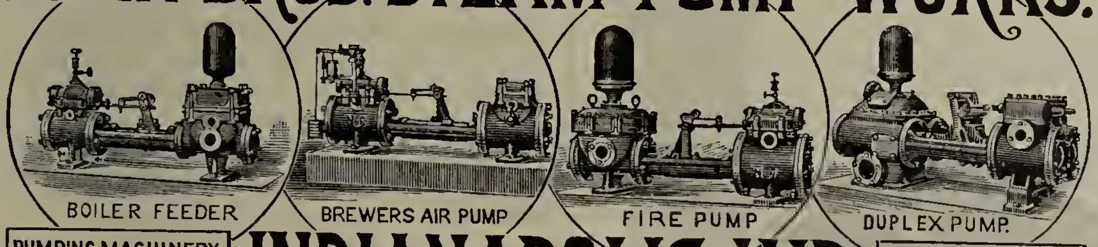

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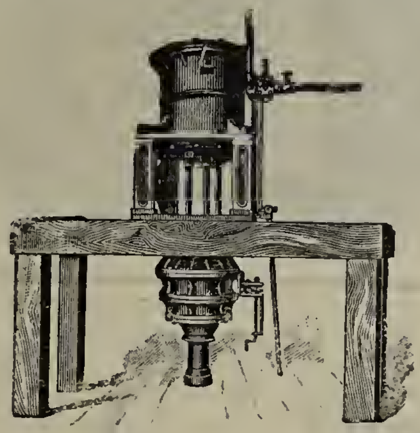

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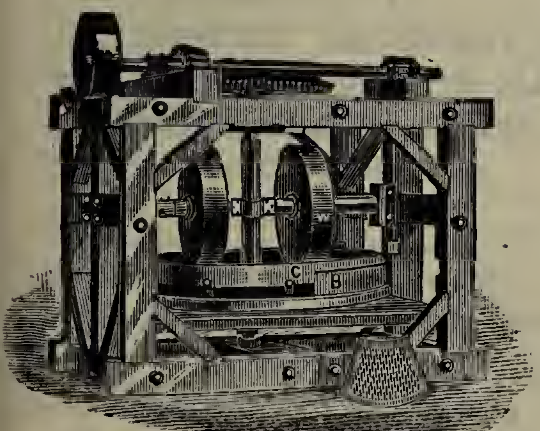

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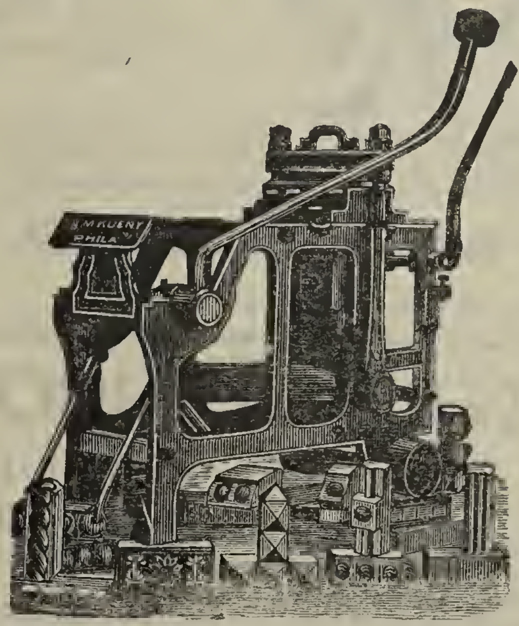

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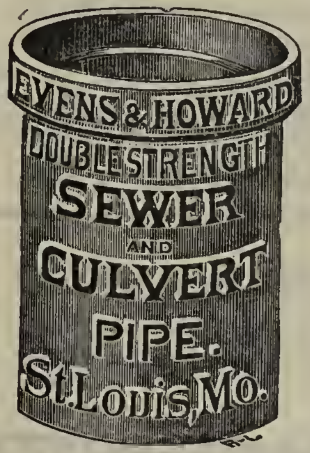

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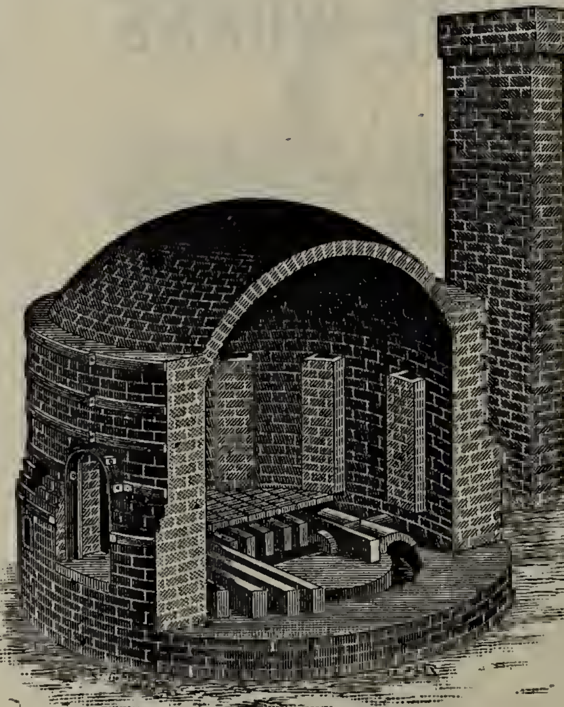

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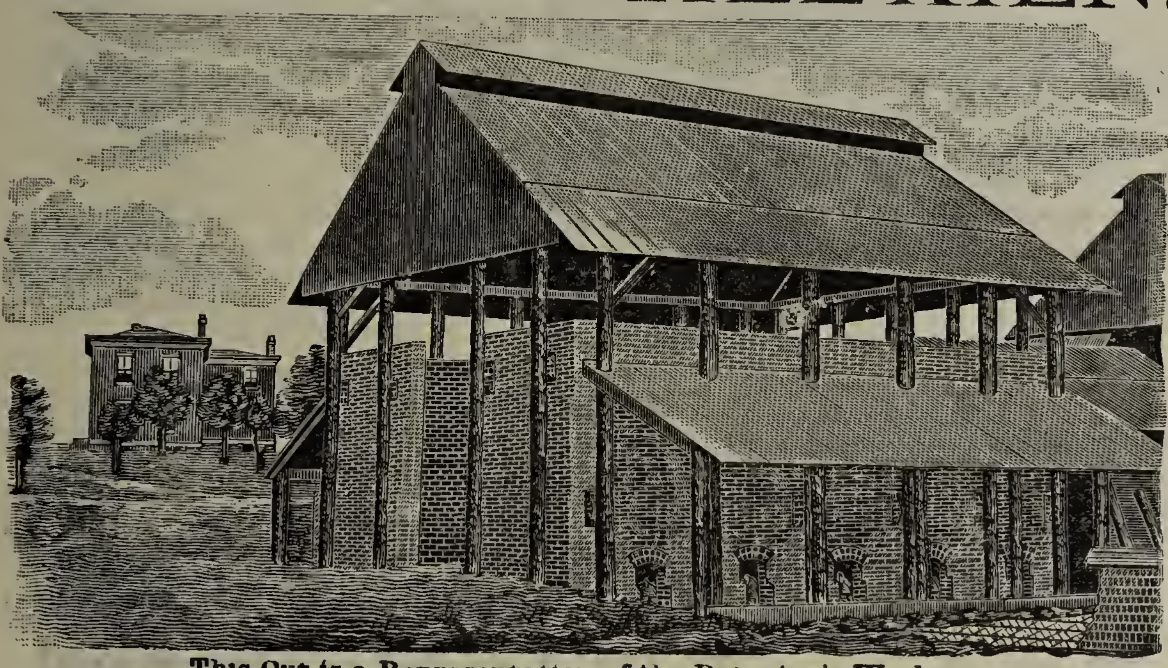

This Cut is a Representation of the Patentee's Works.

In this invention I do not claim perfection, for progress is onward. There is no end to human achievements. This I do claim, that the quality of the bricks it turns out, is as good as the best; being nearly all hard burned brick. That it takes less time, less labor, and consequently less fuel in burning than any other plan of brick kiln in use, and it is easily operated.

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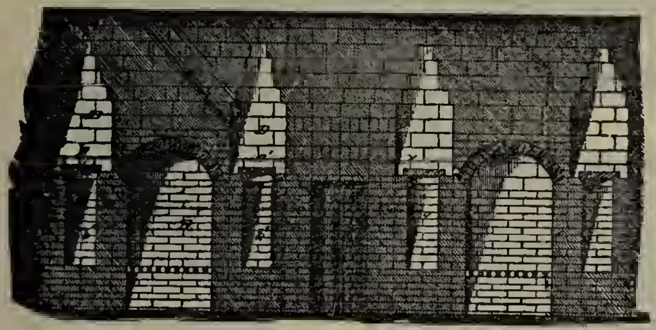

Fig. 1.

The peak holes not shown are the same as in the common case brick kilns, thus enabling one to see the state of the arches when burning. Fig. 1, is a front or side elevation with wall removed, which plainly shows the green brick kiln as it is built over the permanent mason work. Every bench alternately resting on the furnaces and the mason work which is the kiln floor. this floor is a perfect support to the crown of the furnaces. D. D. are the arches of the green brick kiln, B. the furnaces, b. b. the hot air chamber of flues. Fig. 2, is a horizontal section, showing the plan of the furnaces. B. represents the floor of grate surface, b. b. the hot air chambers. The way of the arrows show how the heat is circulated from the rear end of the furnace on each side horizontally in the hot air chambers, from thence vertically through the kiln floor or partition, having apertures into the arches of the brick kiln.

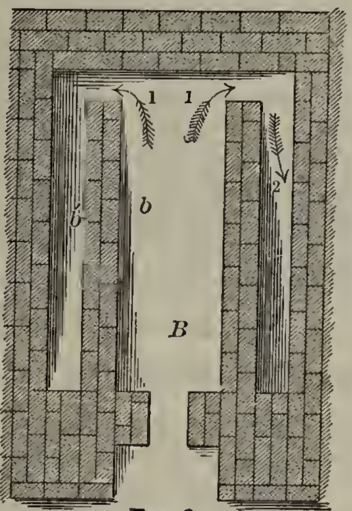

Fig. 2.

This brick kiln burns the brick of even hardness with but little fire marks. The arrangement of these furnaces are complete for perfect combustion. Also, in heating the arches of the brick kiln, there is no plan of furnaces that can equal them. The arch brick is hardly discernable and as perfect as any in the kiln.

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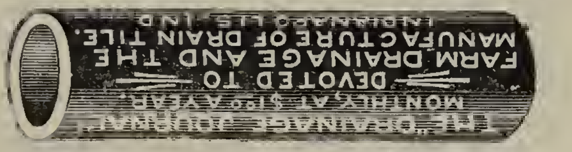
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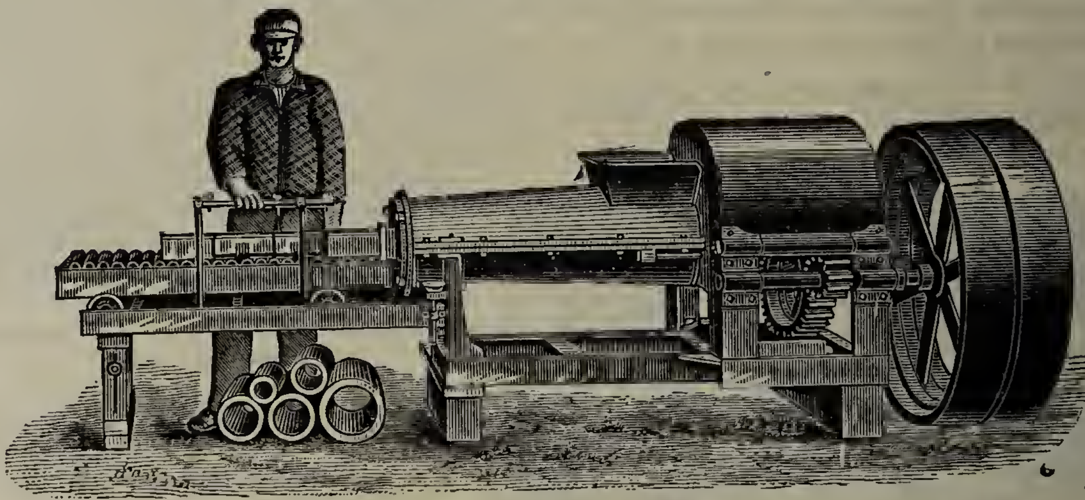
Patented Sept. 22, 1885, Re-issued Feb. 23, 1886. By
M. WALKER and E. MINER, Yankton, Dakota.

We desire to call the attention of all brickmakers to our PORTABLE BRICK HAKE, which certainly furnishes the cheapest and best means of handling brick from the machine to the yard, and from the yard to the kiln ever yet made use of. By this device the brick when taken from the machine are placed directly upon the haking boards, and when filled the haking boards are taken up by the truck and conveyed to the yard, where they are set down in rows end to end, where they remain until dry, when the truck comes again, picks up the hake of brick and takes it to the kiln. Thus one man does the work of four and the bricks go into the kiln in much better shape by not being handled while they are soft. We have a truck made especially for handling soft molded bricks on pallets. Yard County and State rights for sale. Please address for circulars and for further information,

YANKTON PRESSED BRICK CO.,
Or either of the undersigned, patentees,
M. WALKER, or E. MINER, Yankton Dakota.

KELLS & SON'S IMPROVED
Brick and Tile Machines!

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of Brick and different sizes of Tile by changing dies. For strength and durability we except none. We chalenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22, 1880; and February 12, 1884. We can furnish Crushers and also Trucks.

We can produce side cut Brick with our down cut-off, and make perfect edges and corners without the use of water or oil.

We have had Twenty-two Years' Experience in the Manufacture of Brick and Tile Machines.

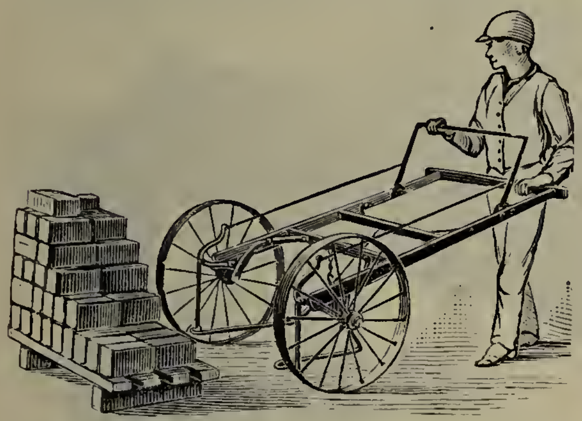
We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 18 inches and on our No. 2 Machine we can make tile from 2½ up to 12 inches.

☞For Illustrated Circulars, Prices, etc., address

KELLS & SONS,

SHOP NEAR NEW COURT HOUSE. ADRIAN, MICH.

STEELE'S IMPROVED Brick Truck —AND— Portable Hack.



The principle of handling and drying bricks by the Portable Hack System has been perfected in this Truck and VENTILATED HACK BOARD, being the most practical Truck and method ever yet introduced, saving labor in handling and time in drying bricks. Can be used in any yard not too steep. Is especially adapted for medium dry clay machines.

☞Is fully warranted to work as represented.

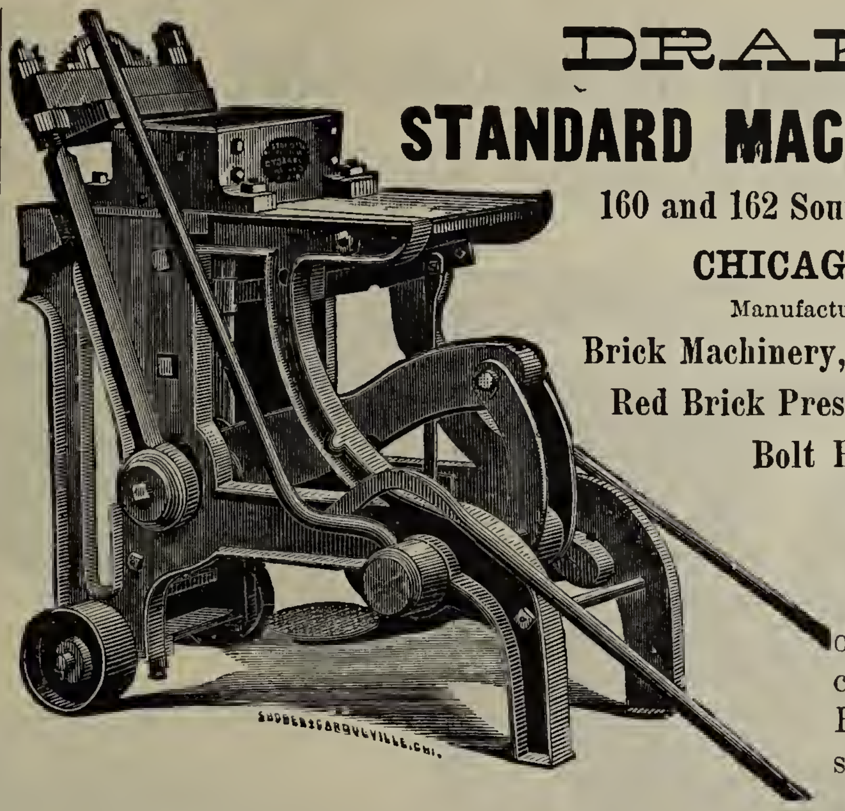
Orders Solicited.

Territory for sale in the Northern and Western districts. Address,

J. C. STEELE, Patentee,
Statesville, N. C.

DRAKE'S STANDARD MACHINE WORKS,

160 and 162 South Clinton St.,
CHICAGO, ILL.
Manufacturers of all kinds of
Brick Machinery, Clay Crushers, Fire and Red Brick Presses, Hydraulic Presses, Bolt Headers, etc.



This cut represents our Patent Press with change of liners in same Press Box for different styles of brick.

DRAKE'S CLAY CRUSHER AND STONE SEPARATOR.

WE GIVE THESE AS REFERENCES:

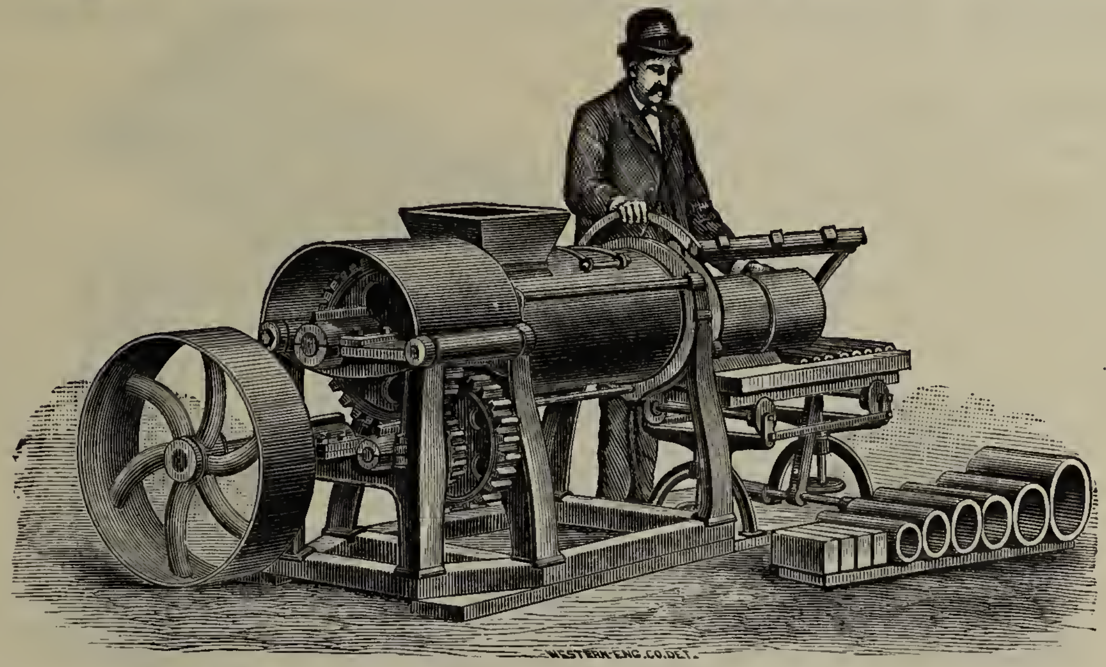
Best in the market for stubborn clay and to separate stones from same. Number used by brickmakers in Chicago: Alsip Brick Co., 3; Hayt & Alsip, 4; J. B. Legnard, 2; May, Purington & Co., 1; Wahl Bros., 2; John Busse, 1; Union Brick Co., 1; Chicsgo Brick and Mill Co., 1; Weckler Brick Co., 1; Adam J. Weckler, 1; L. Weirheim & Son, 1; John Sexton, 1; Chicago Brick Co., 2.

MICHIGAN BRICK AND TILE MACHINE WORKS,

—MANUFACTURERS OF—

Brick and Tile Machinery.

Our new CUT-OFF TABLE for side cut brick, cuts either way and is worked by a cam, thus enabling us to cut on a circle and to make a brick when dry and burned that is absolutely perfect. Side cut brick when cut straight are always warped, especially brick made by auger machines. Our invention overcomes this objection and it is the only cut-off made that will produce a perfectly straight brick when burned. This cut-off can be used on any machine.



The Michigan Brick and Tile Machine.

TWO SIZES { No. 1 makes tile from 2½ to 12 inches.
{ No. 2 makes tile from 2 to 8 inches.
Either Side or End-cut Brick.

1856.

Thirty-three Years of Practical Experience.

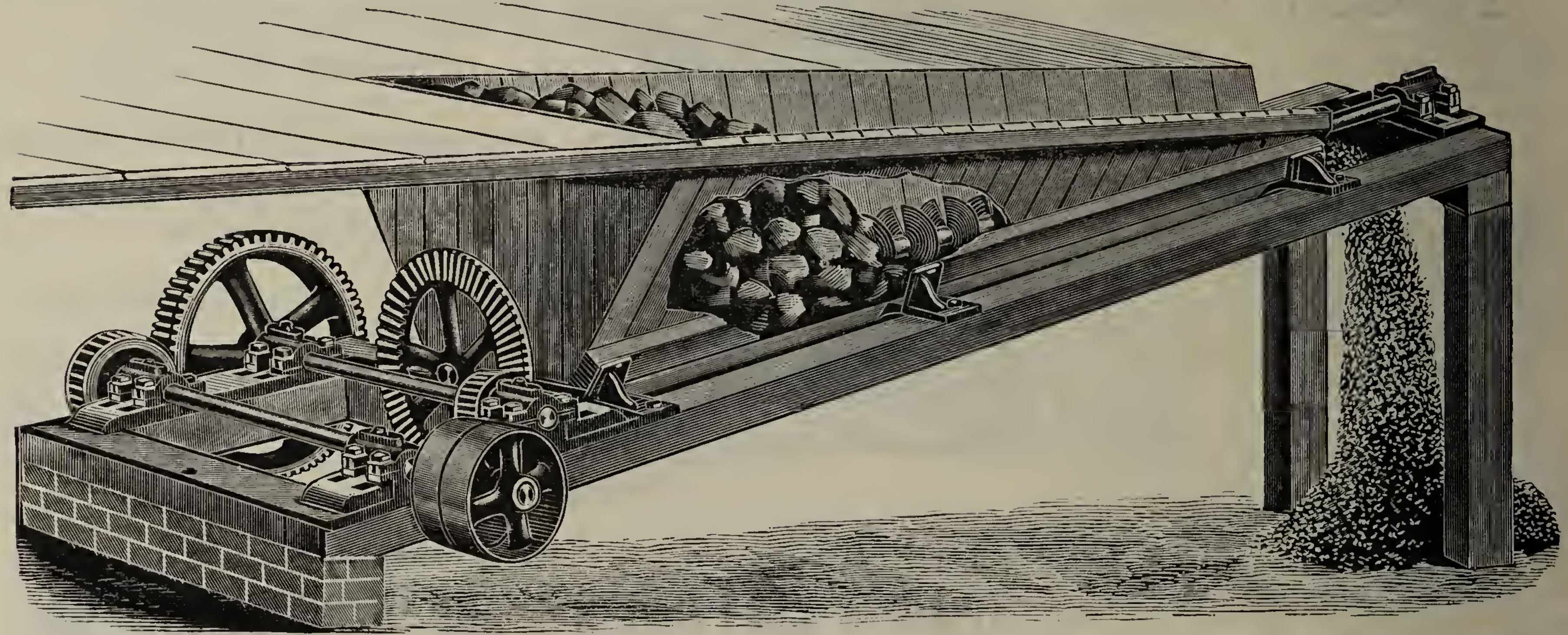
1889.

MICHIGAN BRICK AND TILE MACHINE WORKS.

Lenawee County, (Mention the Clay-Worker.) MORENCI, MICH., U. S. A.

Emen's Patent Perfection Clay Granulator and Feeder.

SOLD SUBJECT TO TRIAL AND APPROVAL.



Saves time and labor and produces better ware; simple in construction; rapid and accurate in operation Every brick, tile and sewer pipe manufacturer should investigate the merits of this machine.

During the past season it was introduced in several of the leading Chicago brickyards and is now at work giving entire satisfaction. Write for descriptive circulars.

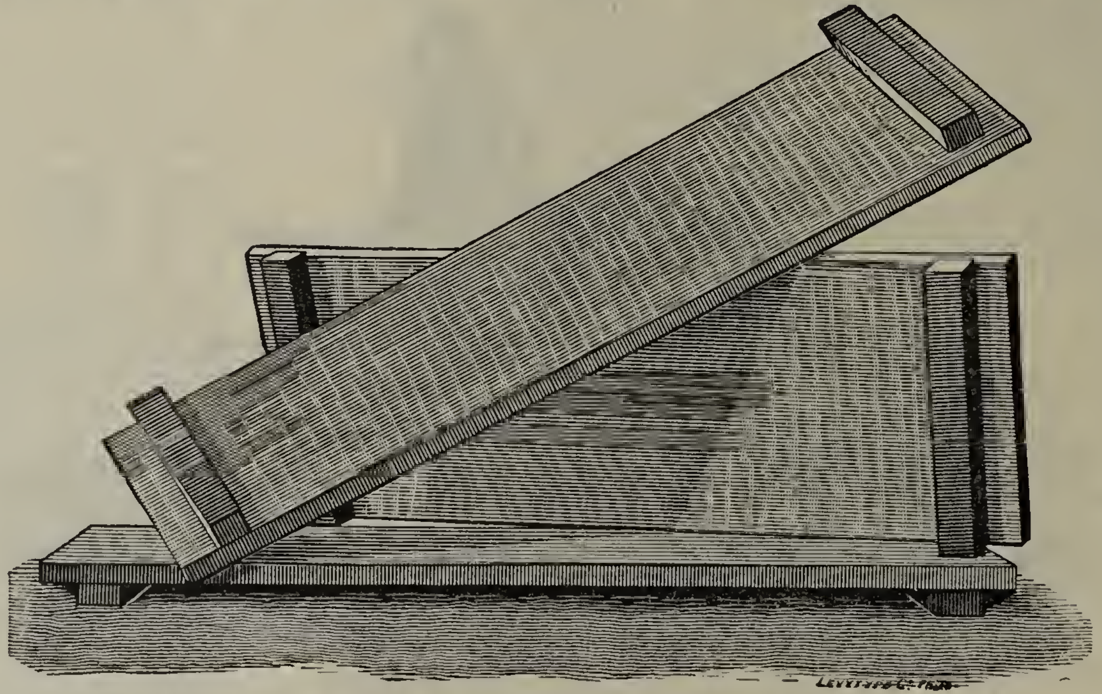
Chambers Brothers Company, of Philadelphia, Pa., are licensed to manufacture and sell these machines.

EMENS AND COLE

]Mention Clay-Worker.] HOLTON, (MUSKEGON CO.) MICH.

BRICK PALLETS.

BRICK PALLETS.



BRICK PALLETS.

PIPE BOARDS, ROOFING LUMBER Supplied Direct in Carload Lots.

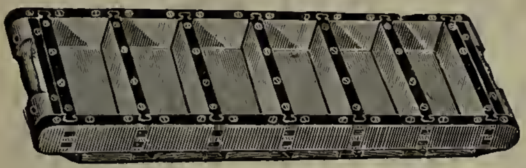
When writing for prices, give an exact description of the kind of pallet wanted, as different pallets are in use in different sections of the country. State whether cleats are to be nailed on; also length, width and thickness of the pallet. We have a big trade in this line and can save you one profit. Write for prices.

W. B. MERSHON & CO.,

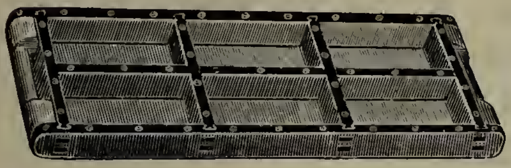
Manufacturers of all kinds of white pine lumber and packing boxes in shooks.

East Saginaw, Mich.

6 B. MACHINE MOULD.



6 B. HAND MOULD.



3 B, HAND MOULD.

D. J. C. ARNOLD,

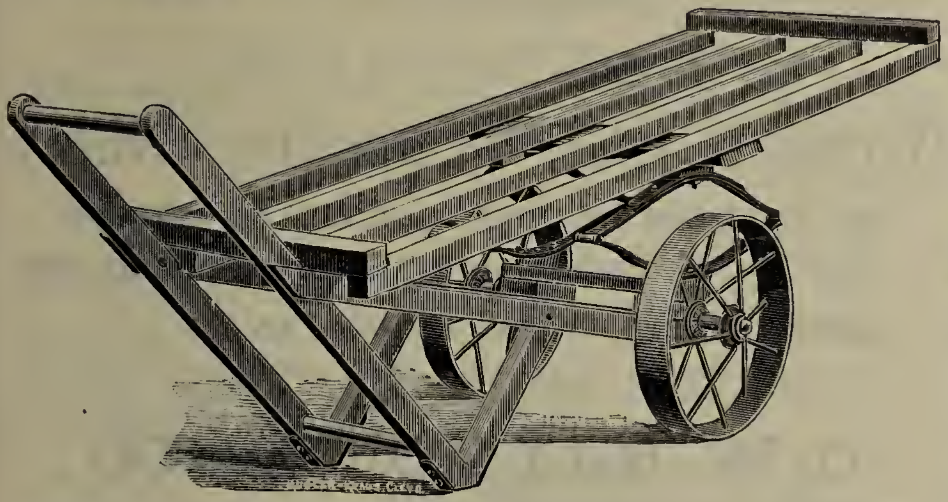
MAKES ∵ BRICK ∵ YARD ∵ SUPPLIES

At NEW LONDON, OHIO.

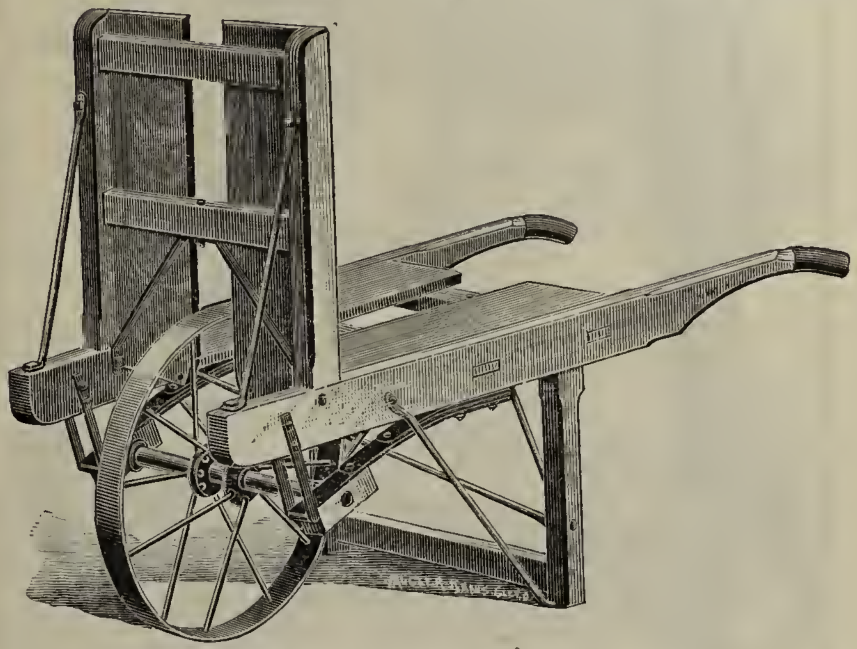
Get his prices before you buy. **All goods first-class in every respect.**

[Mention the Clay-Worker.]

☞**Catalogue sent on application.**



NO. 10 SPRING TRUCK.
(Weight 100 pounds.)



NO. 1 BRICK BARROW.
(Weight with springs 100 lbs.)

Do You Intend Purchasing a New Brick Machine,

—OR,—

Is the Machine You Are Now Using Not Giving Satisfaction?

If so, it will pay you to investigate the merits of our **Horizontal Stock Brick Machine.** It is the only machine on the market which does not require extra pug mill *to work the clay direct from bank.* The only one which will work the clay so stiff the brick will not pitch in trucking or spread in drying. It has no light, complicated parts underneath where the sand and dirt can get on them. Every part is out where they can be kept clean and oiled. It is the strongest and most durable machine ever made. Our prices are lower than those of any Vertical Machine and Pug Mill. All machines are guaranteed to give satisfaction and erected subject to trial. We make a specialty of erecting complete plants. It will pay you to write us for prices and terms before purchasing elsewhere. We also manufacture full line of brickyard supplies, Pug Mills, Disintegrators, Mould Sanders, Trucks and Barrows.

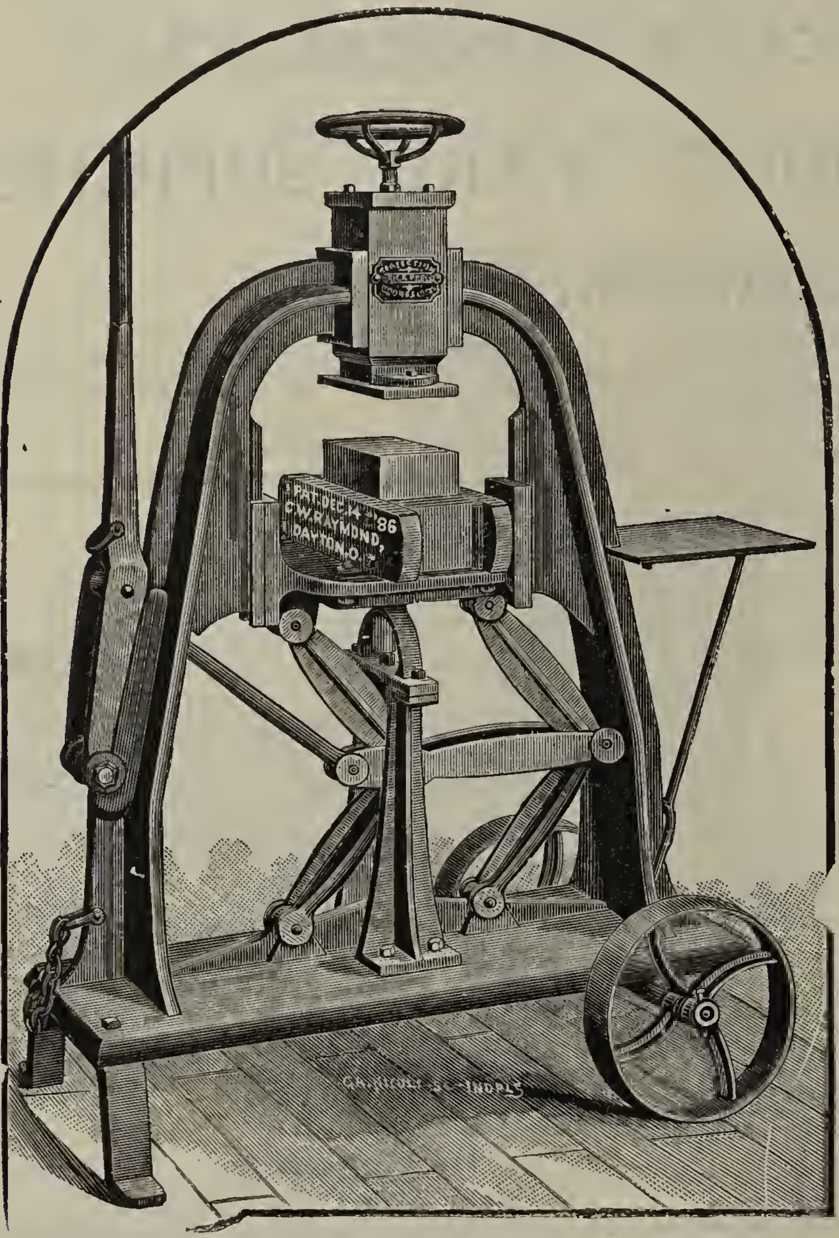
Greenville, Mich., July 10th, 1888.

A. POTTS & Co., GENTLEMEN—We enclose balance due on Horizontal Brick Machine. We are very much pleased with machine; it has done all you guaranteed. The brick made are perfect. Capacity only limited to our facilities for handling. We can recommend it to anyone wishing a successful brick machine. Wishing you success we are Yours Truly, F. N. WRIGHT & CO.

A. POTTS & CO.,

Indianapolis,
Indiana.

Mention the Clay-Worker.]



RAYMOND'S

PERFECTION BRICK PRESS.

(No. 1 for Red Brick. No. 2 for Fire Brick.)

SIMPLE AND POWERFUL.

Its whole action is derived from a short, easy, but powerful movement of one lever. A PERFECT Press which turns out perfect work.

—MANUFACTURERS OF—

RAYMOND'S

Wrought Iron Tempering Wheel,

OFF-BEARING TRUCKS, BRICK AND SPRING BARROWS, MOULDS, KILN DOORS, ETC.

Send for Illustrated Catalogue.

ADDRESS

C. W. RAYMOND & CO.,

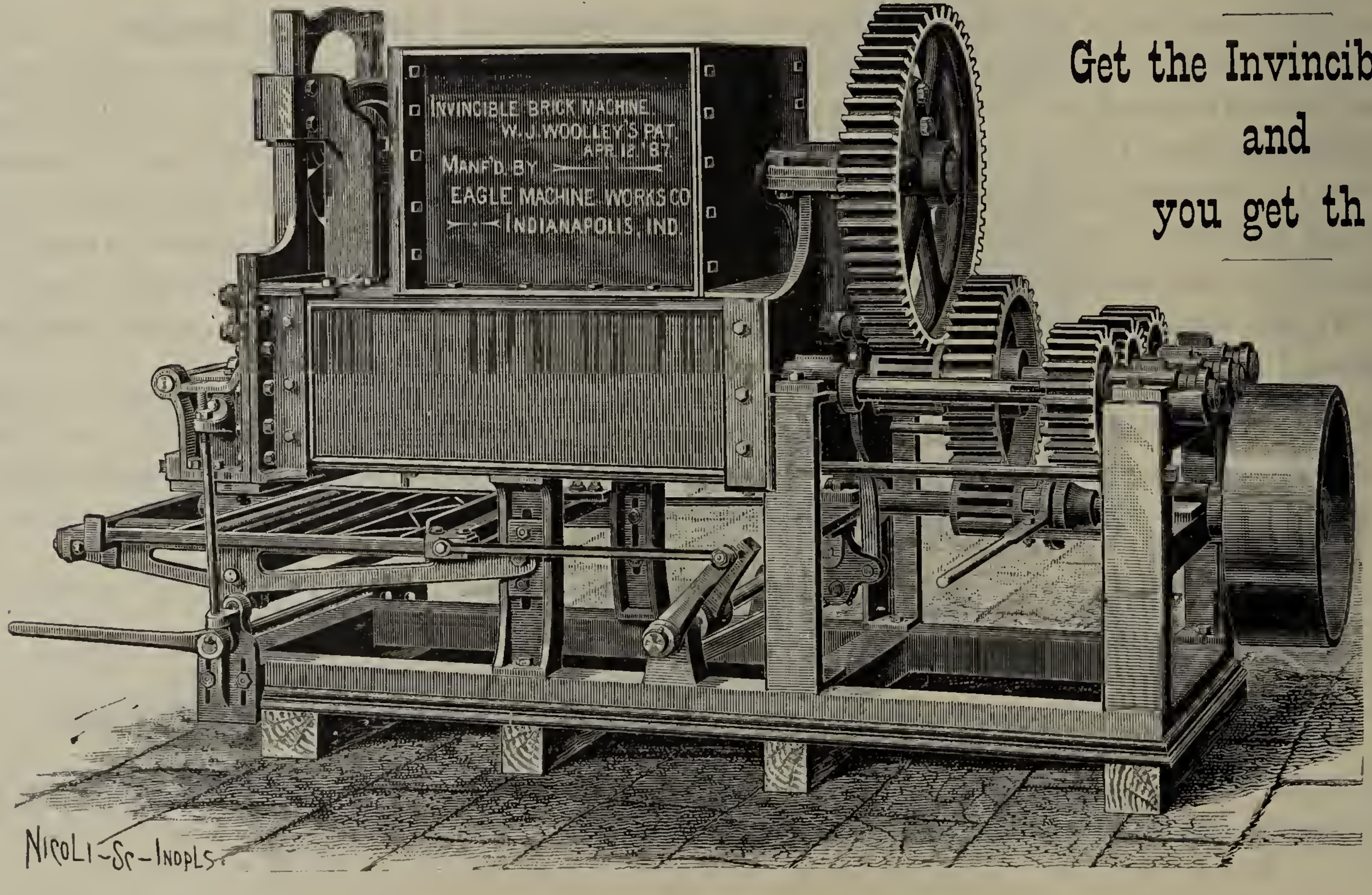
[Mention the Clay-Worker.] **DAYTON, OHIO.**

The Invincible Brick Machine.

The STRONGEST, MOST DURABLE and BEST BRICK MACHINE in the market. Write for full description, prices, etc., to

EAGLE MACHINE WORKS CO., Indianapolis, Ind.

Get the Invincible
and
you get the best.


INVINCIBLE BRICK MACHINE.
W. J. WOOLLEY'S PAT.
APR 12 '87
MANF'D. BY
EAGLE MACHINE WORKS CO
INDIANAPOLIS, IND.
NICOLI-Sc-INDPLS.

H. Brewer & Co's. Clay Crusher and Stone Separator.

The prominent feature in this Crusher is the combination of two smooth, tapering crushing rolls, running at different speeds, in connection with an adjustable transverse roll which is of irregular form and provided with teeth or spurs, whereby the clay is rapidly broken up and crushed, and the stones separated therefrom.

TESTIMONIALS.

Saunemin, Ills., May 18th, 1888.
H. Brewer & Co., Gentlemen—Your Crusher works to a charm and we are very highly pleased with it. It runs one-half easier than any other Crusher we have had.
Yours Truly,
SAUNEMIN BRICK AND TILE CO.

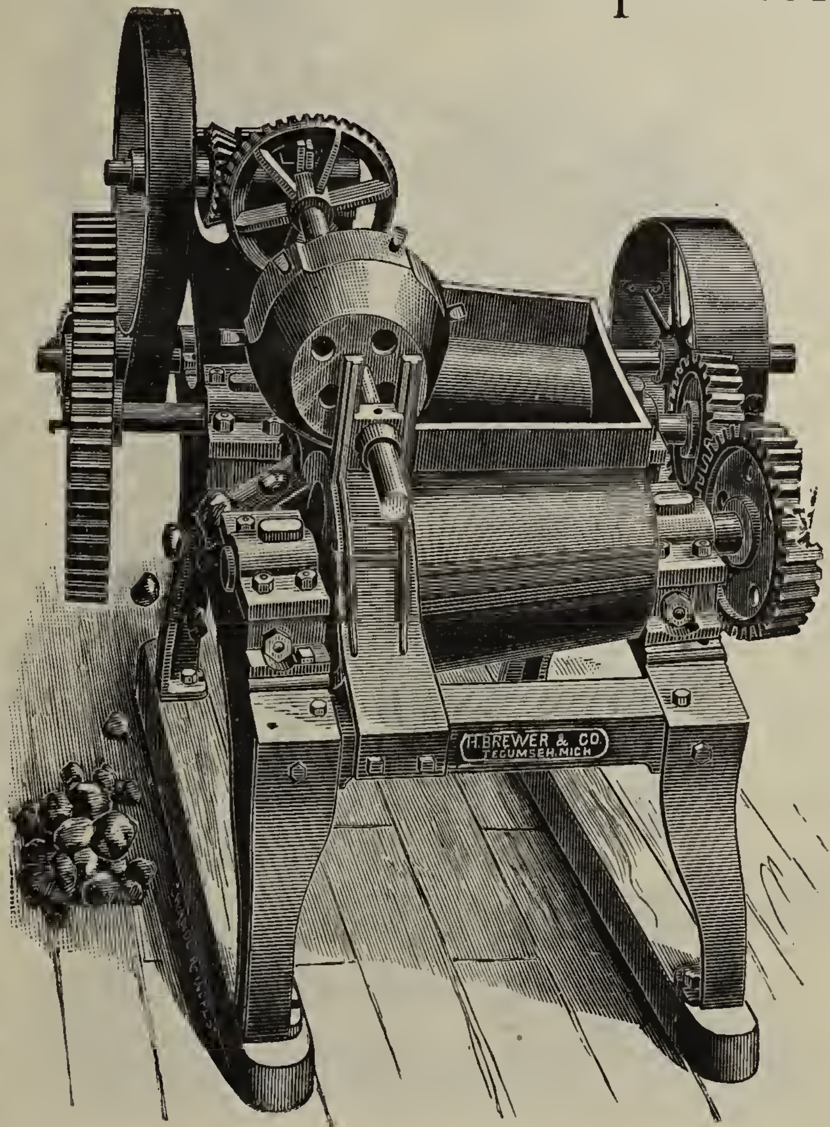
Budd, Ills., May 3d, 1888.
H. Brewer & Co., Dear Sirs—The Crusher and Elevator work to my entire satisfaction. I feel confident I would be $2,000 ahead, to-day, had I put in your Machine and Crusher at the start.
Yours Truly,
HENRY SIEDENTOP.

Monroe, Iowa, May 15th, 1888.
H. Brewer & Co., Gentlemen—The Crusher is giving good satisfaction and I think will do all that is claimed for it.
Yours,
T. P. BURCHINAL.

☞ Do not fail to obtain our prices on Tile Machines, Brick Machines, Pug Mills, Clay Crushers, etc. For illustrated Catalogues and Price List, address

H. BREWER & CO.,
Tecumseh, Mich.

(Mention Clay-Worker.)


H. BREWER & CO.
TECUMSEH, MICH.

STEDMAN'S IMPROVED

Disintegrator and Pulverizer.

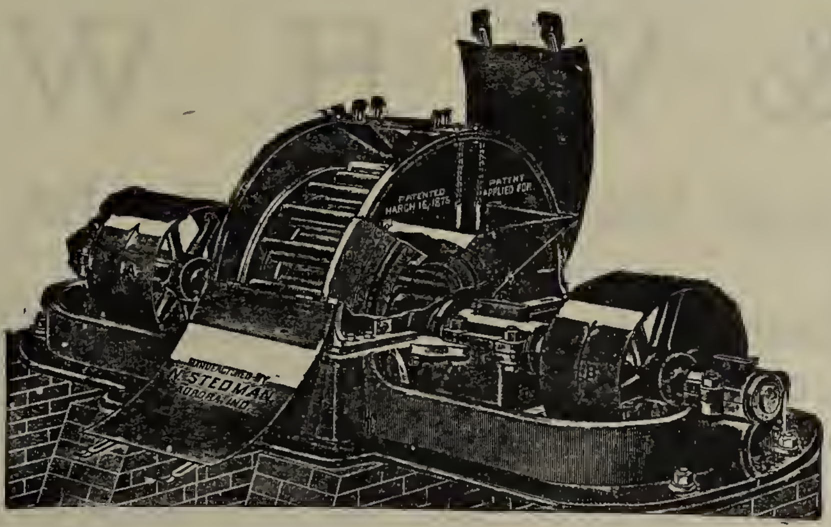
This mill will disintegrate or pulverize the following materials:

Clays of all kinds, Shale and Slate direct from the bank, for Brick and Tile.

Fire Clay and Sand Stone Rock—for Cement and Fire Brick.

Iron Ores of various kinds, Guano, Phosphates, Bones—green, dry steamed, Tankage, Bone-Ash, Salt Cake, Soda, Cracklings, Oyster Shells, Animal Matter in almost all conditions, Old Fire Brick and Tiles.

Old Pottery Ware, Plastic Clay, Asbestos, and in fact almost any material that can be disintegrated.


PATENTED MARCH 16, 1875
PATENT APPLIED FOR.
MANUFACTURED BY N. STEDMAN AURORA, IND.

A good Disintegrator and Pulververizer is a long felt want in many branches of business. This Mill is an improvement over any yet made and is the result of practical experience.

This Mill is made in three sizes: 34, 40 and 48 inches. The capacity for clay is as follows:

34 inch Mill will pulverize for from 15,000 to 25,000 brick per day.

40 inch Mill will pulverize for from 20,000 to 35,000 brick per day.

48 inch Mill will pulverize for from 75,000 to 100,000 brick per day.

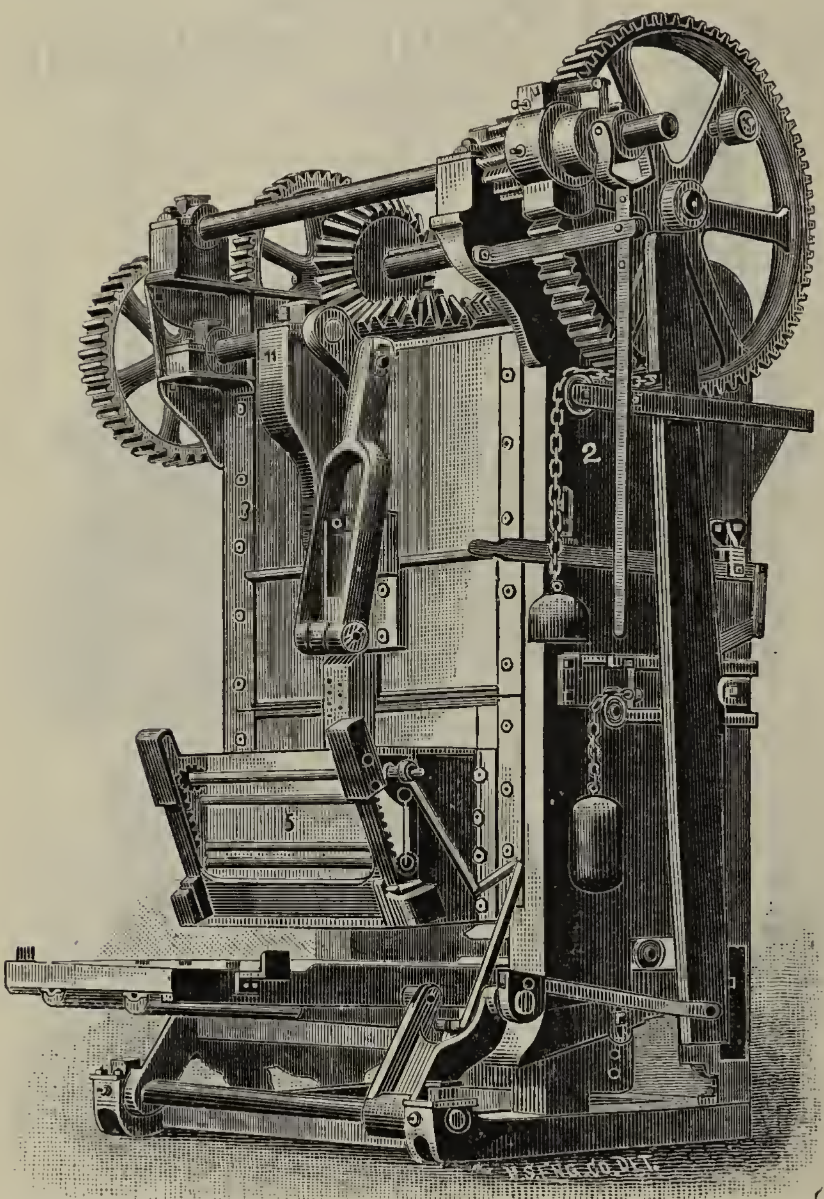
To Brick, Tile and Pottery Men and to Terra Cotta Works this Mill is invaluable. It reduces the clay to a fine, light and soft condition, with its full adhesive properties retained.

For Prices and any other Information, Address

Stedman's Foundry and Machine Works,

PROTECTED BY PATENTS.
[Mention the Clay-Worker.]

AURORA, IND.



THE DUPLEX BRICK MACHINE.

It is made entirely of iron and steel, strong and durable, has a large square tub, with two grinding shafts revolving in cpposite directions which gives it a pugging capacity superior to any other machine in the market. It has a powerful press adjustable drop-table, a very sensive mould-pushing device and safety friction clutch.

Twenty-two Duplex Machines and Elevators have been set up here in Detroit and vicinity alone the last two seasons, with third and fourih orders on hand for more. For catalogue and prices, address

F. HUETTEMAN & CO.

12 to 16 Sherman Street,

Detroit, Mich.

☞ *Plans for New Yards and entire Outfits furnished and contracted for.*

THE STANDARD BRICK MACHINES

—MANUFACTURED BY—

A. M. & W. H. WILES,

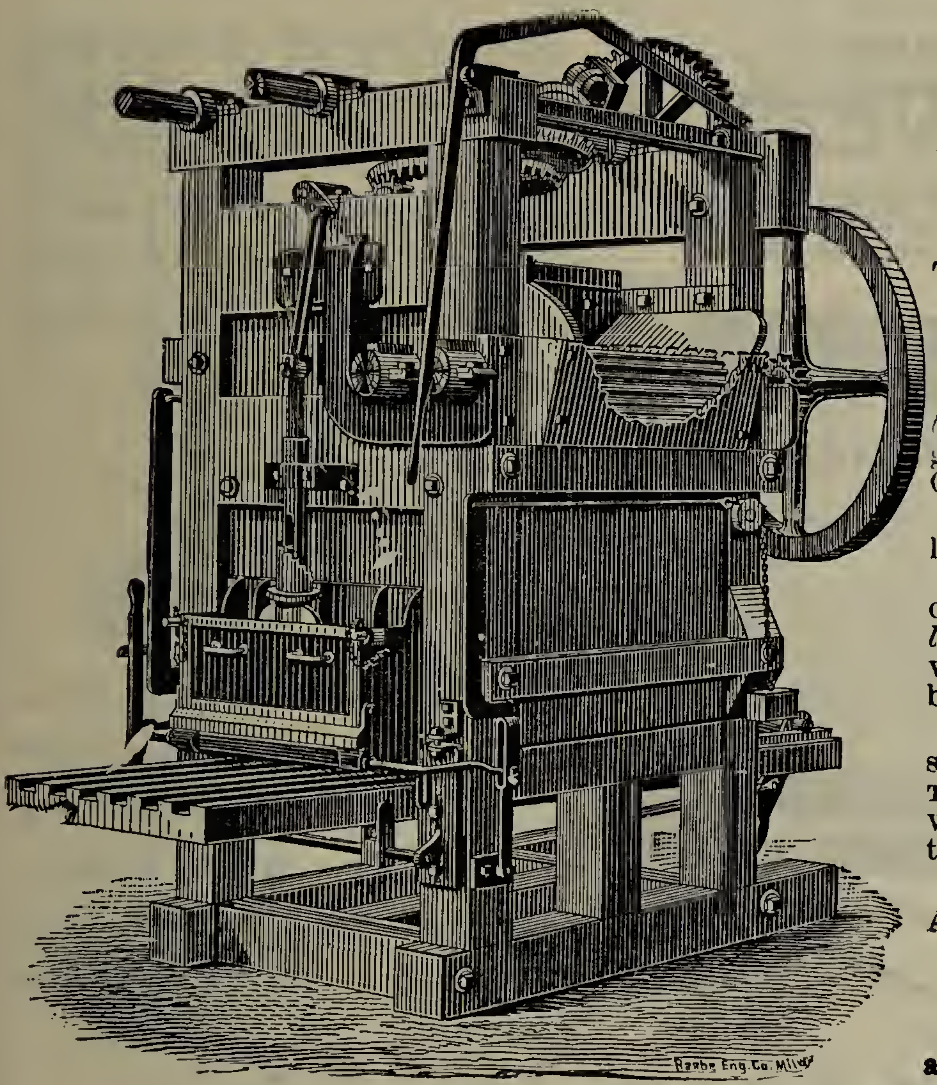
Grassy Point, Rockland County, New York.

These Moulding Machines have been in constant use for over thirty years, and are the original of all machines now made that use a Pug Mill and Square Press, and they are the best and most economical machine now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brick making since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest work in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

Mention the Clay Worker. **CORRESPONDENCE SOLICITED.**



GURNEY BRICK MACHINE WORKS,

MILWAUKEE, WISCONSIN,

Manufactnrers of

THE GURNEY BRICK MACHINE

—Having Crushers Inside of Pug Mill.—

THIS is the only Machine in use which has the *combination of Crushers, Mixing and Moulding Apparatus* in a single machine. The arrangement is covered by patent issued October 6, 1885.

This machine will work any clay, however hard and lumpy, with no preparation before soaking in the usual way. The Crushers will take the clay through as fast as the machine will turn out the brick, *doing entirely away with lumps*, which brickmakers know have been much in the way of making good brick, and also have caused great loss by breakage.

The Machine will turn out four thousand, or more, good, smooth, square brick an hour. With proper moulding sand THE BRICK FROM THIS MACHINE, *made from any clay*, WILL SLIP EASILY. The Machine has been thoroughly tried in different parts of the country.

Also First-Class STEAM and HORSE-POWER MACHINES of same pattern, without Crushers.

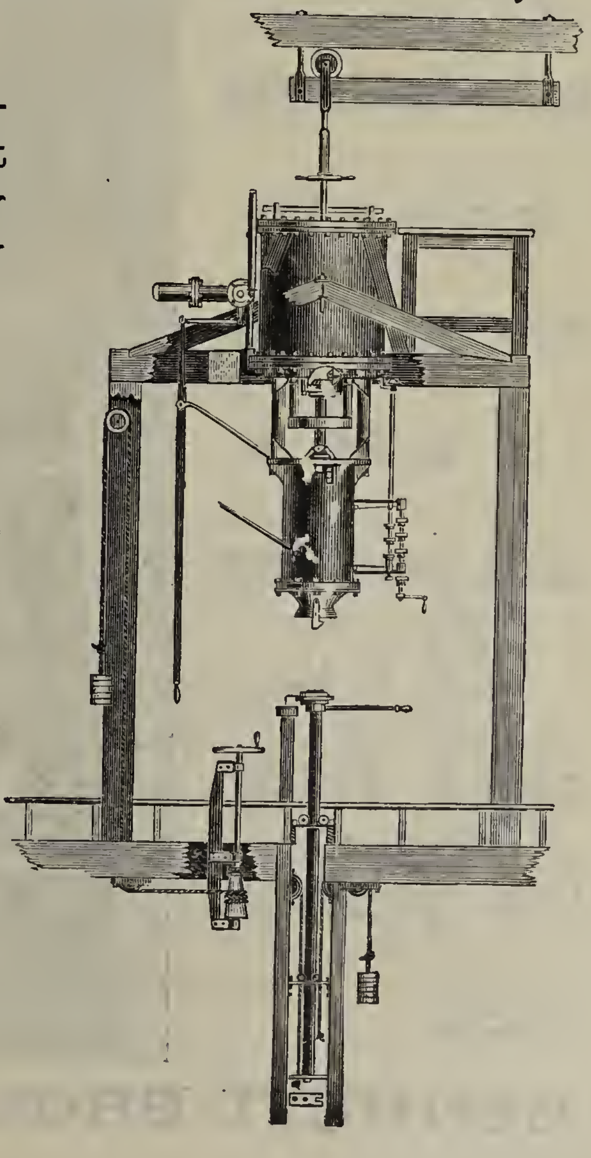
For further information and Illustrated Catalogue address—

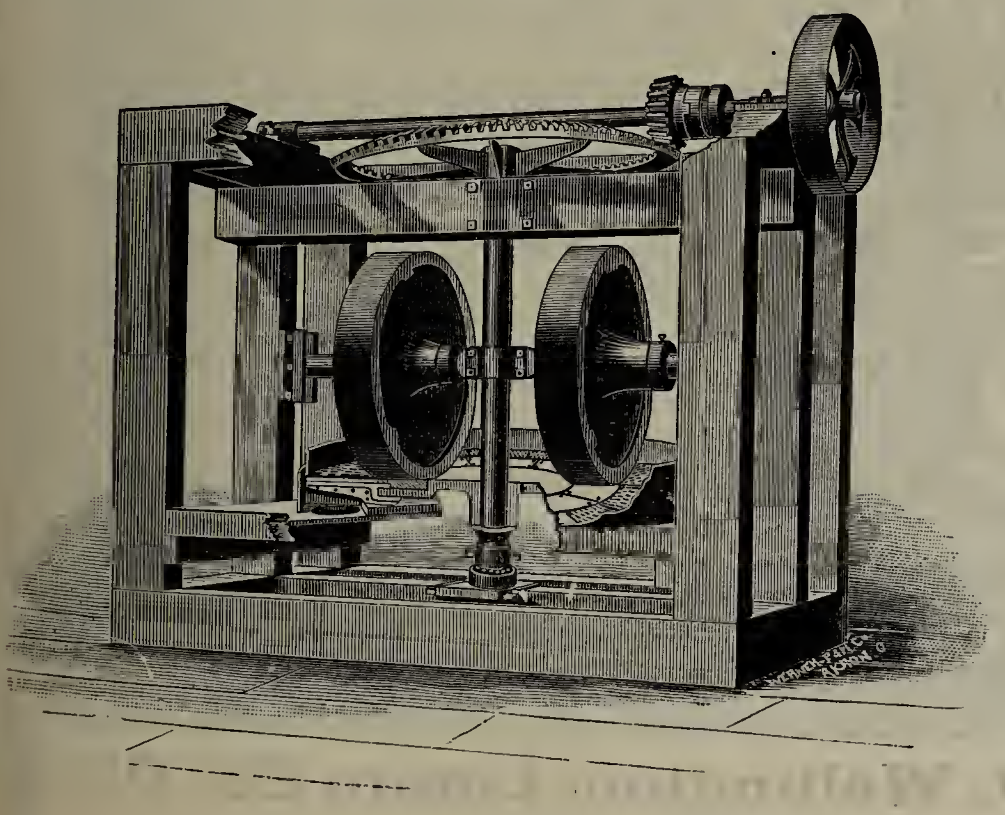
T. C. GURNEY,
100 Wisconsin St., MILWAUKEE, WIS.

TAPLIN, RICE & CO.,

AKRON, O.

Manufacturers of Improved Clay Working Machinery of all kinds, such as Clay Mills, Dry and Wet Pans, the Barber Steam Sewer Pipe Press, Dies, Clay Blockers, Potters' Wheels and machinery of every description. Write for circulars.

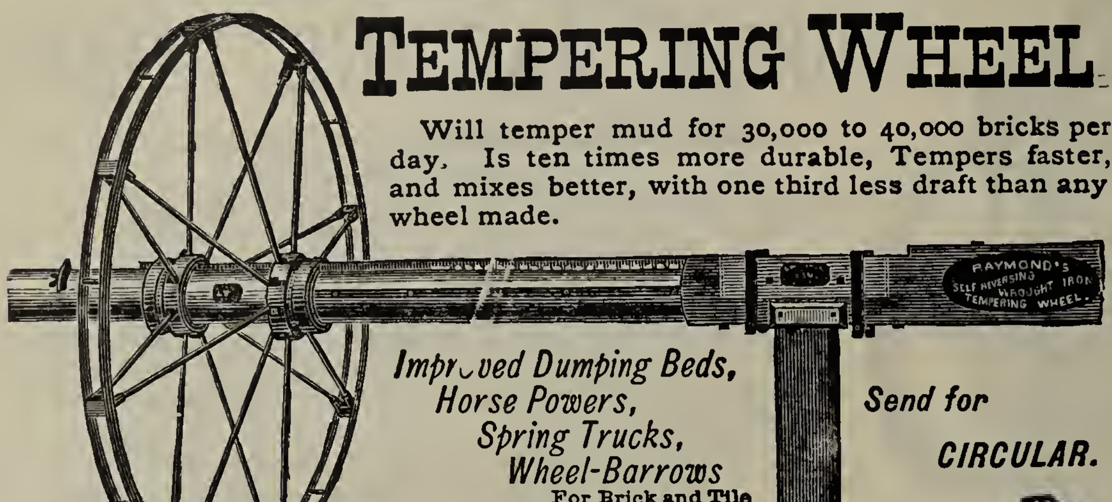




RAYMOND'S WROUGHT IRON

TEMPERING WHEEL

Will temper mud for 30,000 to 40,000 bricks per day. Is ten times more durable, Tempers faster, and mixes better, with one third less draft than any wheel made.


RAYMOND'S SELF REVERSING WROUGHT IRON TEMPERING WHEEL.

Pat'd May 18, 1880.

Improved Dumping Beds,
Horse Powers,
Spring Trucks,
Wheel-Barrows
For Brick and Tile
Brick Moulds,
Kiln Arches,
Grate Bars, &c.

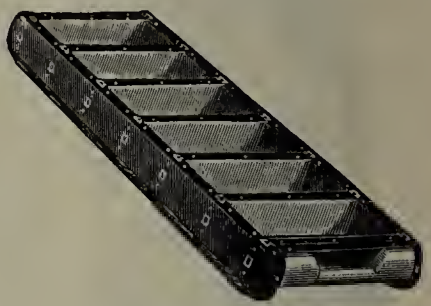
Send for CIRCULAR.

BRICK BARROWS.

Our Barrows are made from the best of seasoned white-oak, braced in front and cross braces underneath; iron wheel and axle and three coats of paint; the frame is morticed throughout. They will stand the rough usage of the brick yard. For strength and durability they have no equal.

BRICK MACHINE MOLDS.

We manufacture a great number and variety of molds and with improved machinery, we are able to fill orders with dispatch. Our molds are made of the best of cherry wood

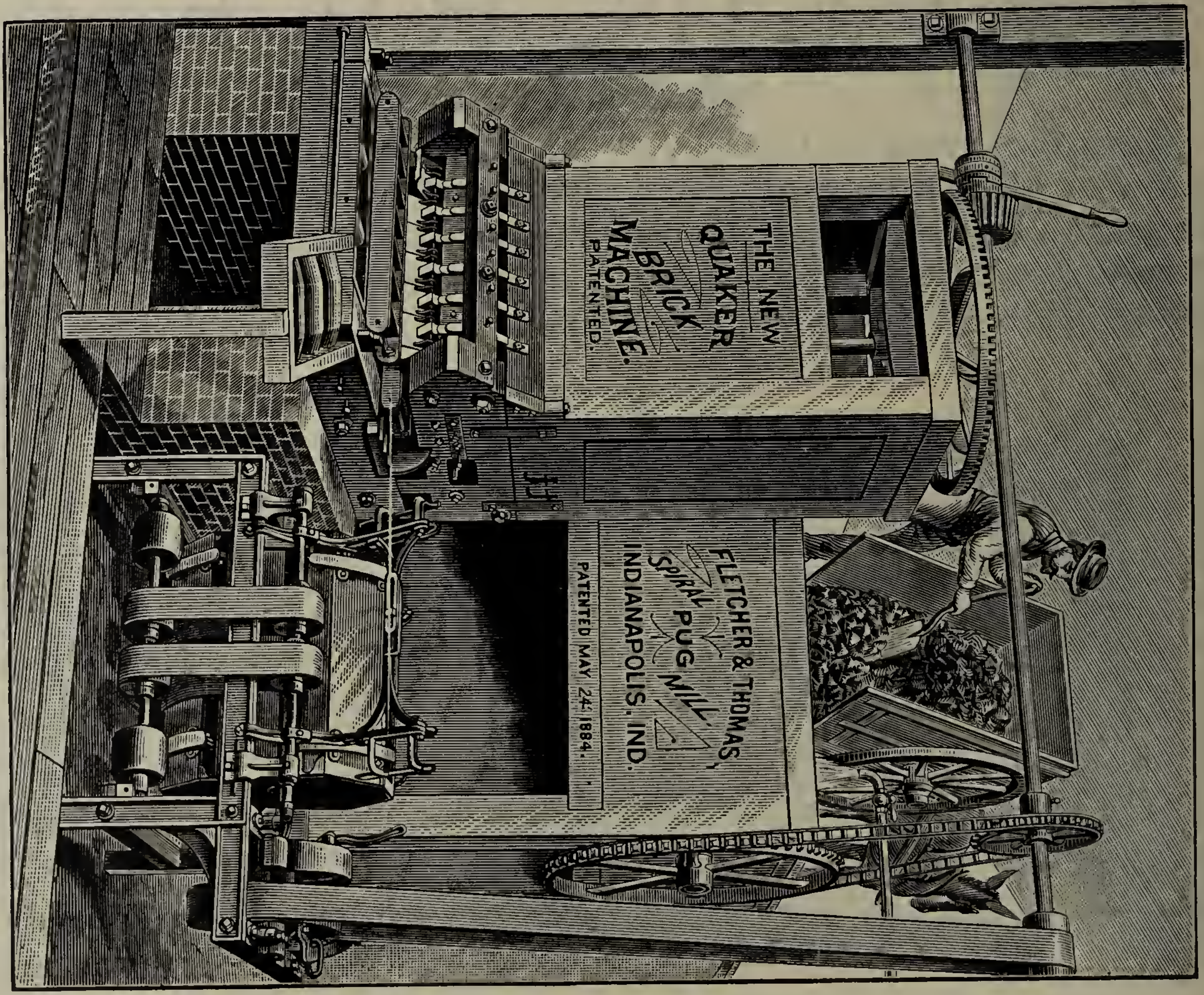


with side pieces gained for partitions and each partition is in turn dove-tailed into the sides. **They are thoroughly iron bound.** The cross-irons being dove-tailed. Without doubt, the most substantial mold made.

C. W. RAYMOND & CO.,

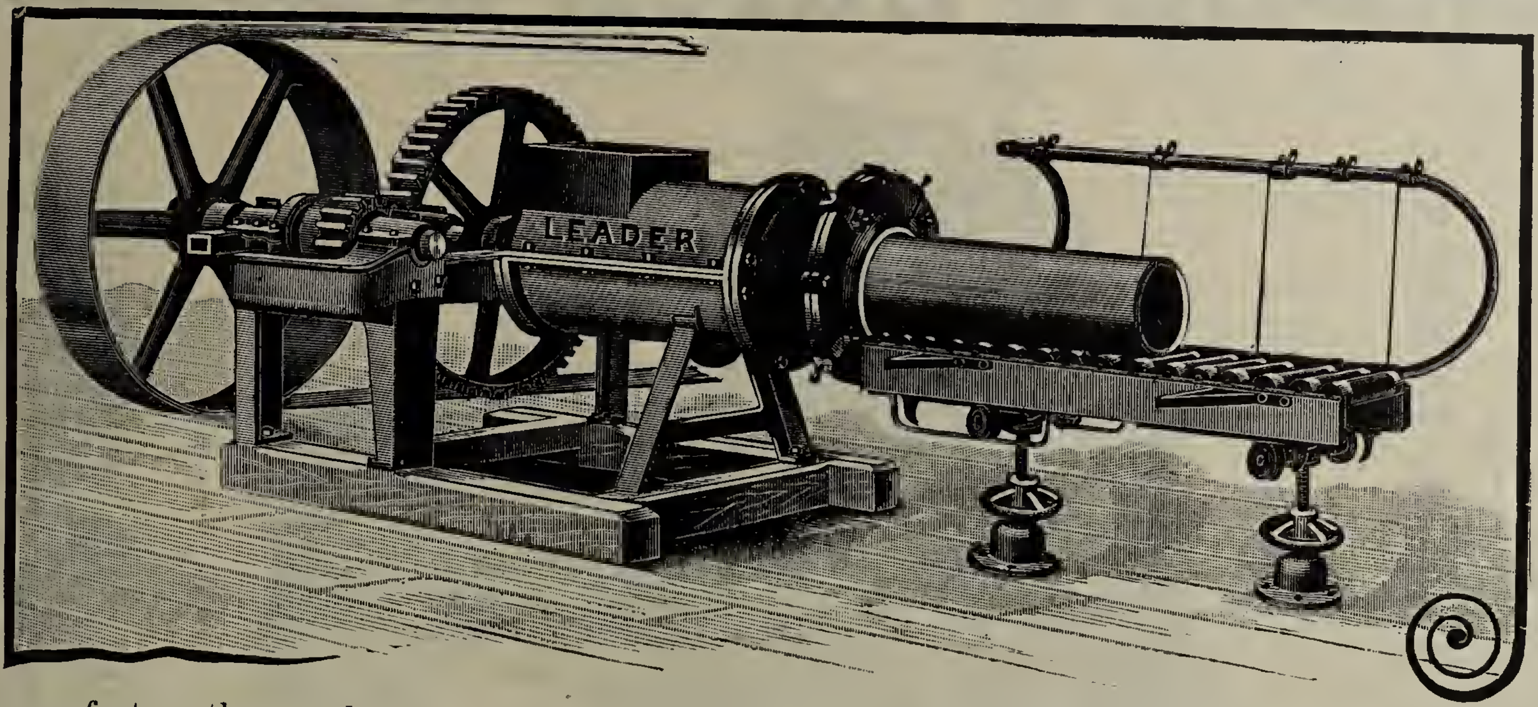
7 & 11 WAYNE STREET. (Mention Clay-Worker.) DAYTON, OHIO.

This outfit will make the largest number of the very best of Pallet Bricks at Least Cost of anything in the market. For further particulars, address


THE NEW QUAKER BRICK MACHINE. PATENTED.
FLETCHER & THOMAS, SPIRAL PUG MILL INDIANAPOLIS, IND.
PATENTED MAY 24, 1884.

BENNETT BROS. & CO., Wellington, Lorain Co., Ohio.

THE LEADER BRICK AND TILE MACHINE.



We manufacture the very latest and best designs of Tile Machines, Brick Machines, Clay Crushers, Elevators, and Dump Cars for handling clay by steam. Design special clay-working machinery to order. Have a large stock of the best cutting wire. Correspondence solicited.

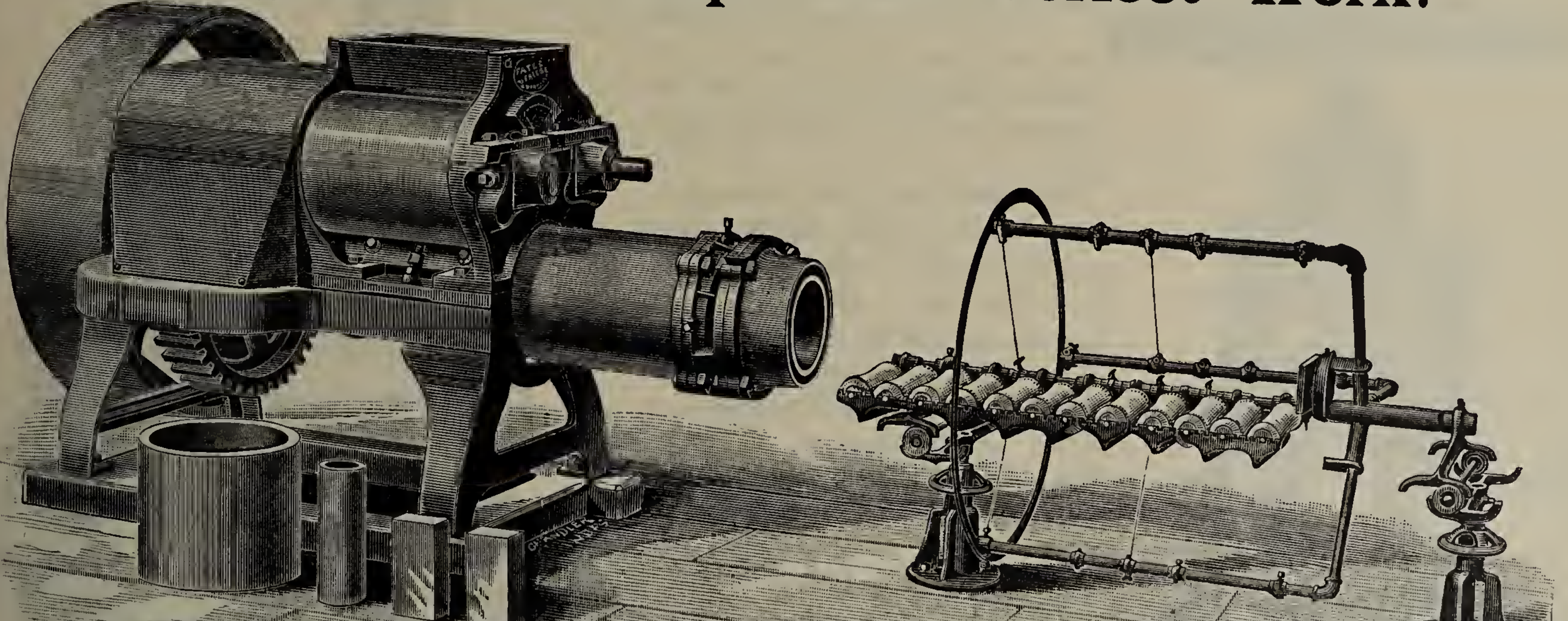
BROWN & HARROP MFG. CO.,

Geo. S. Pollock, Agent, Sullivan Ind

PORTLAND, IND.

THE OHIO BRICK AND TILE MACHINE.

Unequalled for Rapid and Perfect Work!



Most simple, durable and convenient in use. Side or end cut brick. Tile up to 15 inches. We have the latest and most approved Cutting Tables. Satisfaction guaranteed. Factory outfits furnished. Address

FATE & FREESE,

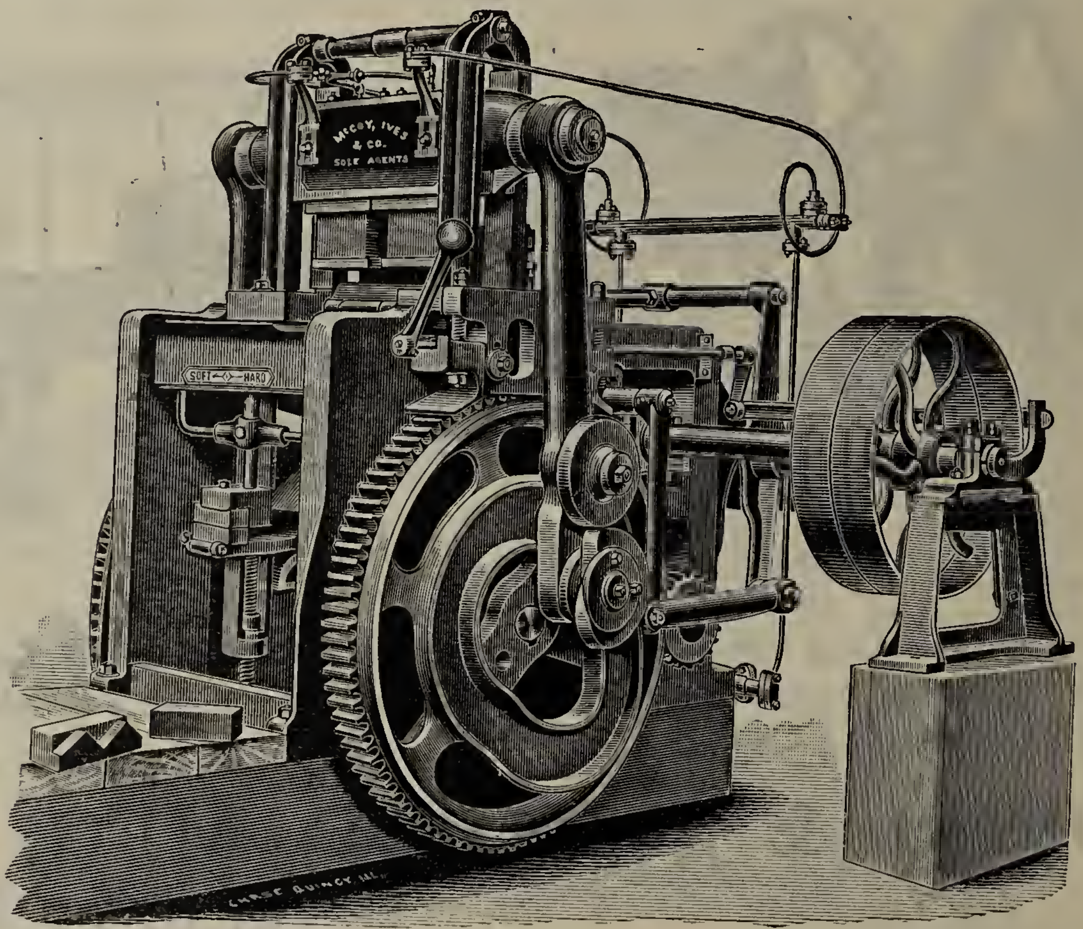
Send for particulars.

PLYMOUTH, OHIO.

WHITTAKER'S CELEBRATED
SEMI-DRY BRICK MACHINE

[Patented in U. S. May 13, 1884.]

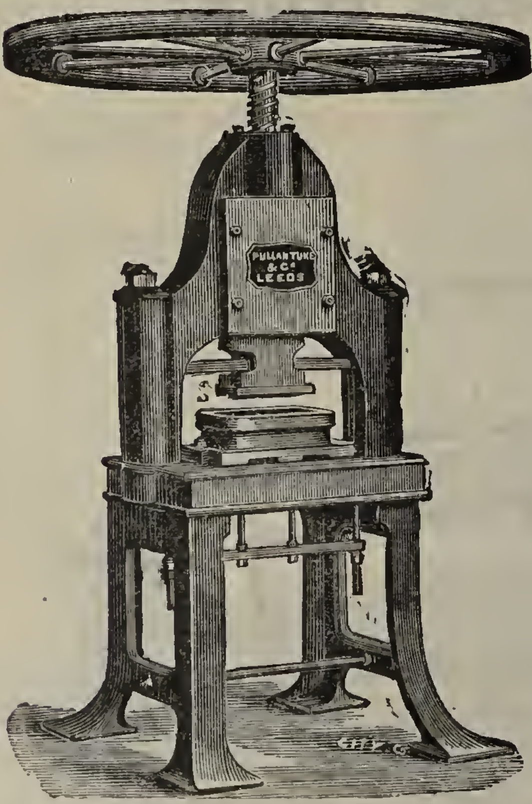
THE BEST ON EARTH.



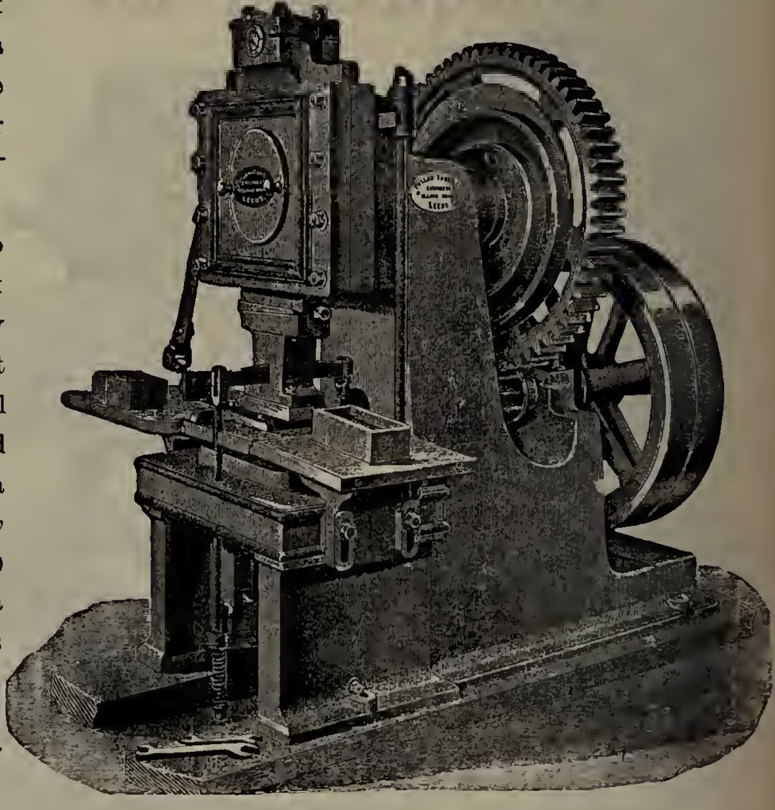
THE BEST ON EARTH.

For Circulars and other information address **McCOY, IVES & CO., Quincy, Ills.**

Titley's Patent Screw Press.



Pullan, Tuke & Gill's Patent Steam Press



WE beg to call the attention of Brick, Tile and Terra Cotta Makers to these two Presses as the *Peers of any press on the market* for superiority of finish in the work produced.

The *Steam Press* is best adapted to large works and will produce the best quality of Front Bricks. Its capacity is 10,000 per day of the finest bricks at the smallest cost for labor. For small works and for all makers of moulded and ornamental bricks, tiles and terra cotta, we recommend the *Screw Press.* It will exert a pressure of 30 tons and is to-day *without a rival* a the *best press on the market.* Its capacity is 3,000 to 4,000 plain brick per day.

Send for circulars giving all information, with testimonials.

ALFRED CROSSLEY,

Sole Agent for the United States. **Ironton, Ohio**

(Mention the Clay-Worker.)

FOR THE MANUFACTURE OF

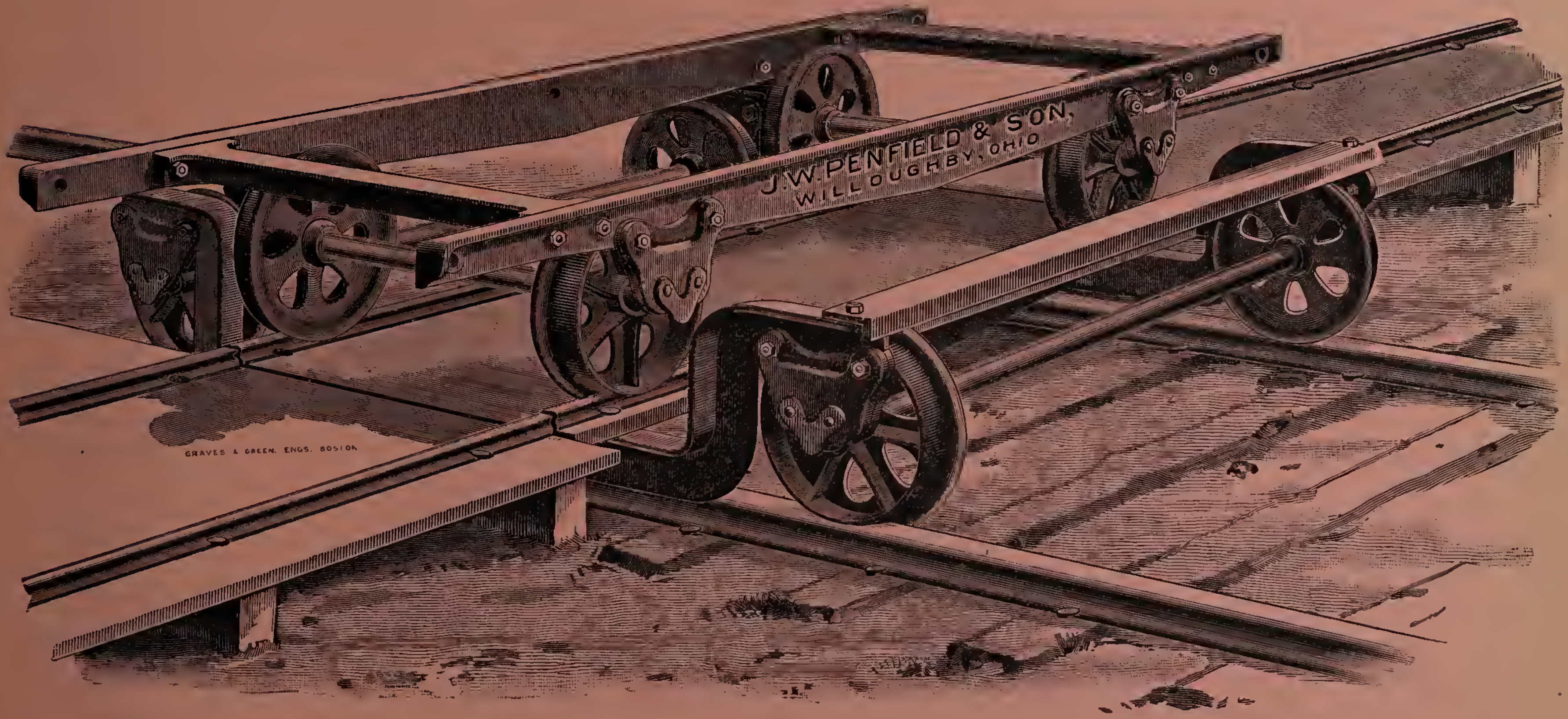
PAVING BRICK

Our Nos. 10 and 20 Machines are Unexcelled.

Capacities Per 10 Hours:

No. 10	S,	25.000	to	30,000	Brick.
No. 10	D,	40.000	to	50,000	Brick.
No. 20		60.000	to	80,000	Brick.

SEND FOR OUR COMPLETE CATALOGUE.



IRON DRY CAR AND TRANSFER CAR.

We are prepared to furnish anything required in the line of Iron Dry Cars, Transfer Cars, Turn Tables, Etc., for any Dryer. Write for prices and description.

OFFER NO. 2.

We have just issued a large life-like lithograph in colors, illustrating an exciting Roman Chariot Race. The Penfield Machinery is there and of course is Triumphant. This picture would be an ornament to any office and will be mailed to any one upon application.

Address the Manufacturers,

J. W. PENFIELD & SON,

[Mention the Clay-Worker]. Willoughby, Ohio, U. S. A.

J. W. PENFIELD & SON,

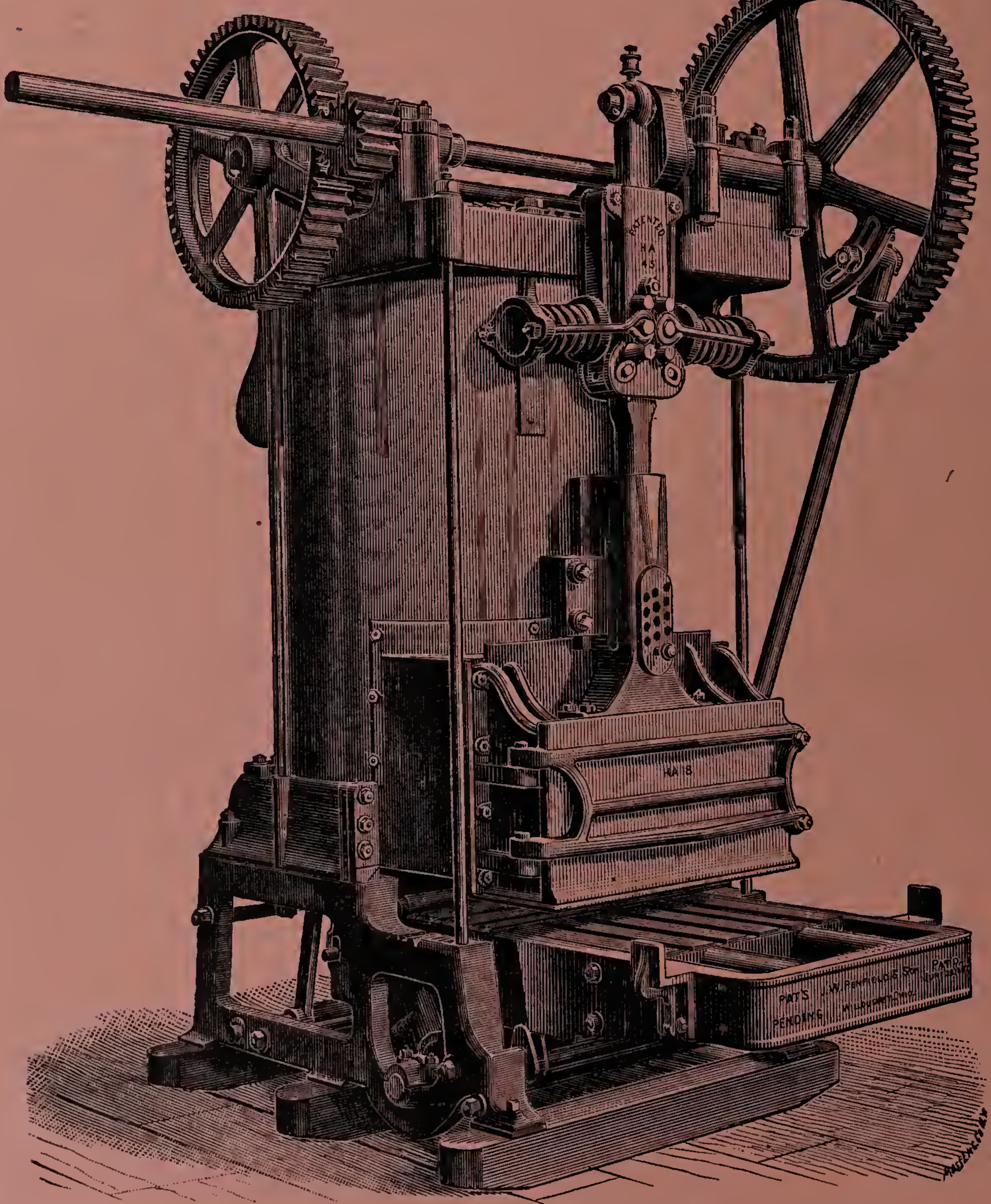
WILLOUGHBY, OHIO, U. S. A.

—MANUFACTURERS OF—

Clay Working Machinery,

Including Stiff Clay and Soft Mud Brick Machines, Tile Machines, Clay Crushers and Stone Separators, Stiff Clay and Soft Mud Pug Mills, Granulators, Elevators, Kiln Castings, Yard Supplies, Dry Cars, Pulleys, Shafting, Etc.

WE HANDLE ENGINES AND BOILERS. **OUR PATENT STEAM DRIERS IS THE BEST.**



[*Patennted June* 28th, 1887, *and Patents Pending.*]

OUR NEW UPRIGHT STOCK BRICK MACHINE.

THE LATEST AND BEST MACHINE ON THE MARKET FOR SAND MOULDED BRICK.

All Iron and Steel.

Moulds the Clay Stiff Enough to Make the Finest Stock Brick. Provided with all the Latest Improvements, Ensuring Convenience, FREEDOM FROM BREAKAGE, Large Capacity and Best Work. Is furnished either with or without Direct-Attached Pug Mill.

Send for Complete Descriptive Circular.

Read the other side. **Come and see us.** **Always Consult the Colored Page.**

The Penfield Stock Brick Machine.

TO ALL BRICK MAKERS.

We take pleasure in introducing to you our

IMPROVED UPRIGHT STOCK BRICK MACHINE,

And wish to briefly state a few of the points of excellence which it possesses:

This machine is built throughout of IRON and STEEL, is EXTREMELY HEAVY, and without doubt the STRONGEST Sand-Moulding Machine manufactured. It works the clay stiff enough to make the FINEST Stock Brick, filling out the corners square. It is provided with an Automatic Relief on the plunger, preventing liability to breakage in working stiff clay. Owing to the manner of construction the work of pugging the clay and that of pressing are each performed by a separate set of gearing. This makes the machine DOUBLY STRONG. To prevent any springing, two heavy wrought iron strain-rods are used, extending on each side of the machine from the upper casting of machine, which holds the crank down, and being attached directly to the legs of machine. This makes the process of pressing the brick absolutely rigid, allowing no yielding of pressing box while filling or pressing out the moulds.

The machine is thoroughly well built in all its parts. The press-box is planed and the front to press-box is hinged, making this part of the machine readily accessible. The tub and pressing-box are extra large, making it possible to make six of the largest sized fire-brick in each mould.

WE CLAIM

That this machine will successfully mould STIFFER CLAY and make BETTER STOCK BRICK than any other sand moulding machine made.

That it is the best constructed and MOST DURABLE MACHINE built.

That the automatic relief on the plunger is a COMPLETE SUCCESS, entirely obviating liability to breakage and enabling the operator to work the clay as stiff as it is possible to mould a sand mould brick.

This Machine is also Provided with an All-iron Pug Mill attached Directly to body of Brick Machine.

We make a SPECIALTY of erecting COMPLETE PLANTS for the manufacture of the finest grades of stock brick, including Brick Machine, Pug Mill, Clay Crusher, Elevator, Mould Sander, Engine and Boiler. Line Shafting, Pulleys, etc., all complete.

OFFER NO. 3—THE BEST OF ALL.

We will agree to furnish any one wishing the BEST SAND MOULDING BRICK MACHINE made, one of the PENFIELD LATEST IMPROVED UPRIGHT STOCK BRICK MACHINES, guaranteeing ENTIRE SATISFACTION in every respect, both as to quality of brick and the construction and working of the machine. We claim to have the BEST, and GUARANTEE SATISFACTION.

Address the Manufacturers,

I. W. PENFIELD & SON,

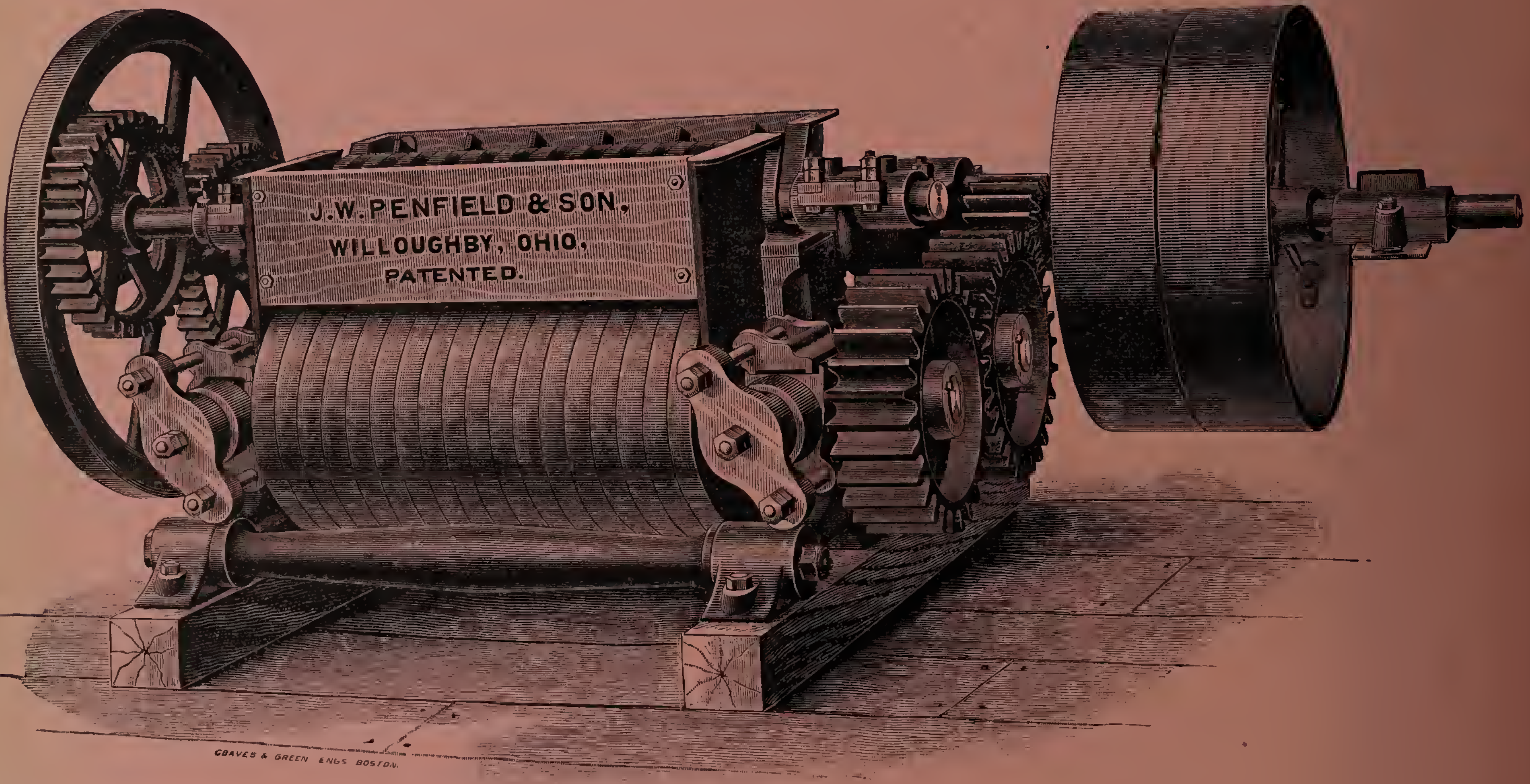
WILLOUGHBY, OHIO, U. S. A.

THE PENFIELD

Clay Crushers and Stone Separators

Compound Four Roller Crushers. Conical Crushers, with Smooth or Corrugated Rolls. Differential Motion Crushers, with Smooth or Corrugated Rolls. Corrugated and Smooth Roll Crushers of all sizes and Styles. All Provided with

THE PENFIELD PATENT AUTOMATIC RELIEF CLODBREAKER


J.W. PENFIELD & SON,
WILLOUGHBY, OHIO.
PATENTED.
GRAVES & GREEN ENGS BOSTON.

The above cut represents our No. 4 Corrugated Clay Crusher and Stone Separator with Automatic Relief Clodbreaker. It will crush clay for 25,000 to 50,000 brick per day. Especially adapted for crushing hard, tough, lumpy clay.

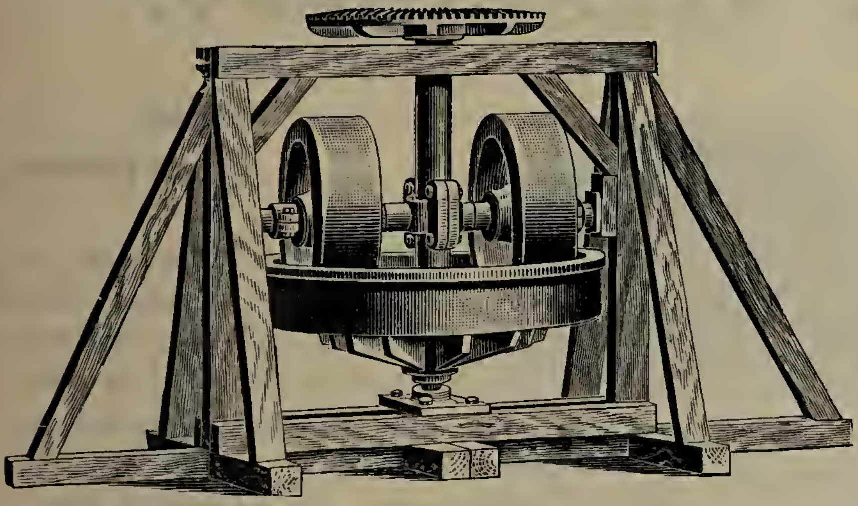
Crushers for Use in Connection with Sand Moulding Machines a Specialty.

Crushers furnished of any desired capacity, and Satisfaction Guaranteed. Our Line of Clay Crushers is the Largest and Most Complete in the market.

Address the Manufacturers,

J. W. PENFIELD & SON,

Willoughby, Ohio, U. S .A.



THE FROST
Dry & Wet-Pan Crushers, Chasers, Etc.,

—FOR—

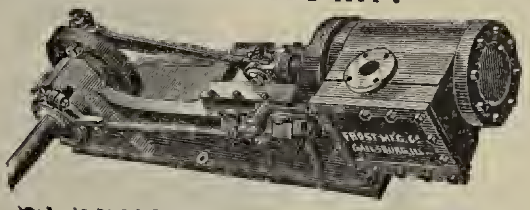
BRICK, TERRA-COTTA, SEWER PIPE AND FIRE CLAY.

—o—

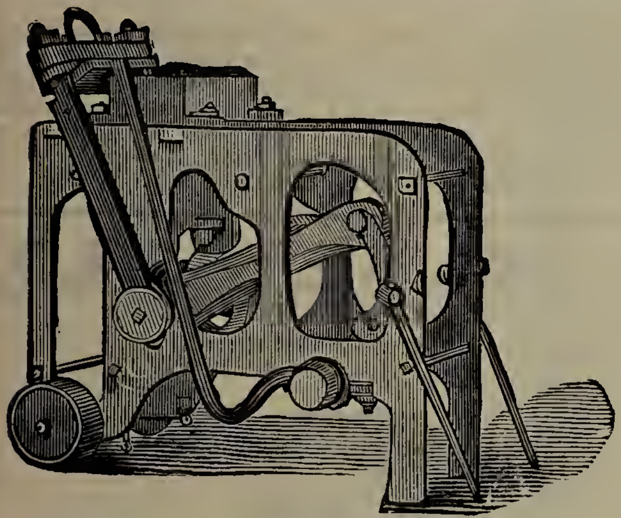
The best and cheapest machines made for working hard clay, soap stone, grog, etc.

Write for prices and other information.

THE FROST ENGINE CO.
GALESBURG, ILL.
ALL SIZES UP TO 150 H.P.


FROST MFG. Co. GALESBURG ILL.

ELEVATOR SUPPLIES
PULLEYS, SHAFTING, SPROCKETS, BUCKETS, BELTING, SHELLERS, CLEANERS, MILLS, &c.
SEND FOR CATALOGUES

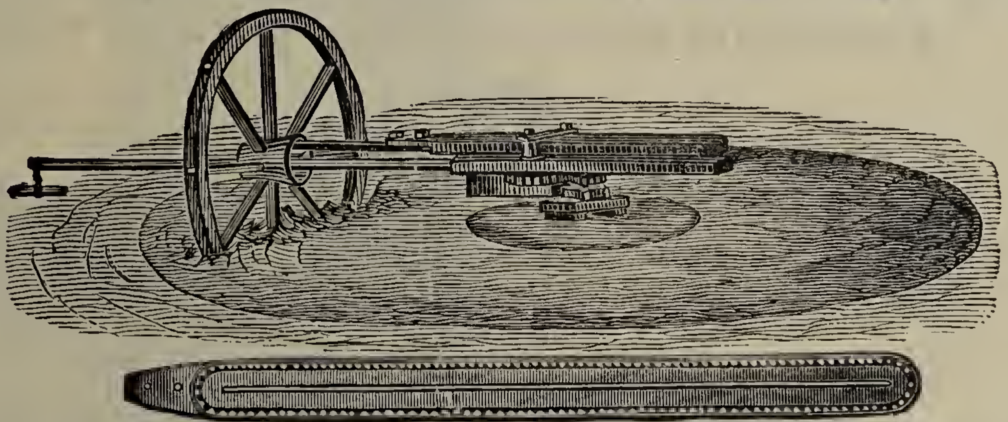


RED BRICK PRESS.

GEORGE CARNELL,
Nos. 1819 and 1821 Germantown Avenue,
and Fifth St.,
PHILADELPHIA, PA.
☞Send for Circular and Price-List.

Philadelphia Brick Machine Works
—MANUFACTURER OF—
FIRE AND RED BRICK PRESSES.

Various sizes, from the smallest size up to 24 inches; also, manufacturer of **Clay Mills, Tempering Machinery,** and all kinds of **Brickmakers' Tools.**



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and is fitted up ten per cent. cheaper. ☞Mention THE CLAY WORKER.

ESTABLISHED 1812,
AND CONTINUED ON THE SAME PREMISES EVER SINCE.

MILLER'S
BRICK PRESSES,
Introduced 1844 Latest Improved Patents, Aug. 28, 1883.

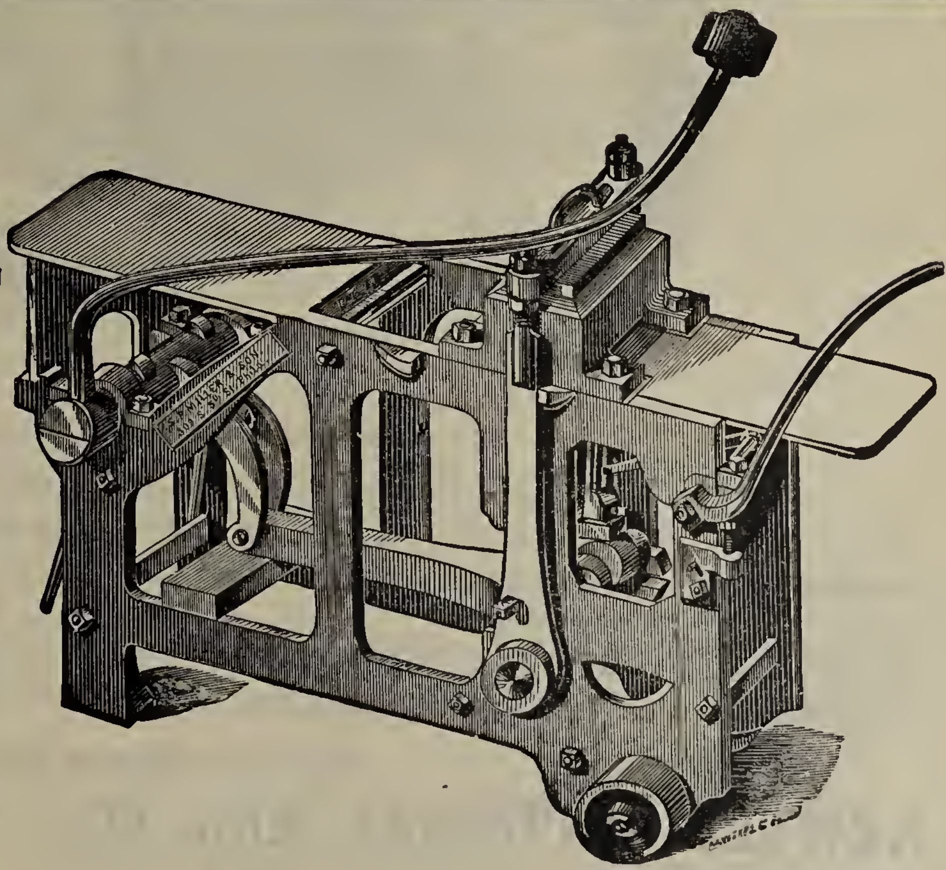
SAMUEL P. MILLER & SON,
MAUFACTURERS OF
RED AND FIRE BRICK PRESSES,

Of five different styles, embodying all the improvements in Hand Brick Presses in use.

Clay Wheels with Reciprocating Rack, Kiln Castings, Brick Moulds, Clay Spades, and the Tools in General Use for Brick Making.

No. 309 SOUTH FIFTH ST., PHILADELPHIA, PA.

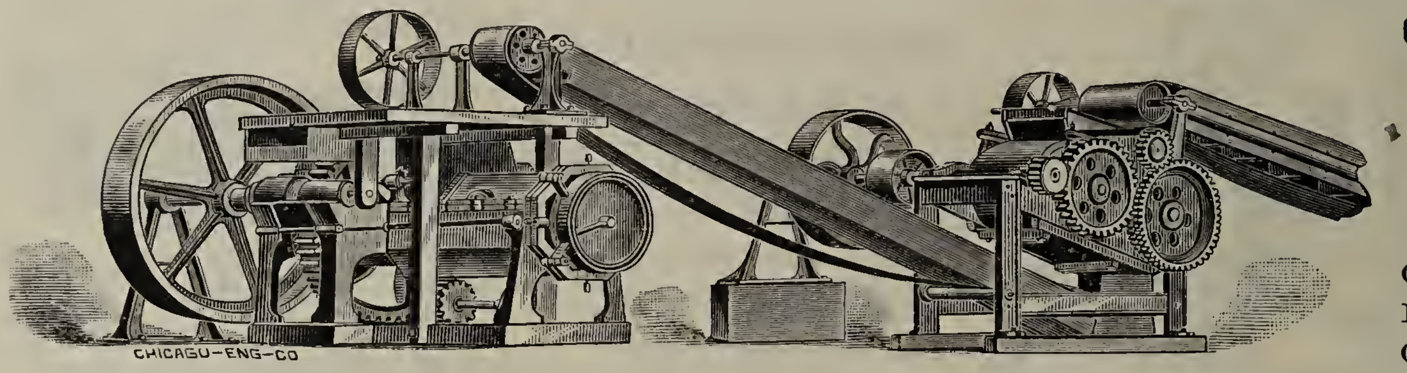
S. P. M. & Son refer to Brickmakers generally. ☞ Orders from abroad promptly attended to.



Adrian Brick and Tile Machine Co., Adrian, Mich.,

—MANUFACTURERS OF—

Brick and Tile Machinery,



Clay Crushers,
Engines
and Boilers.

Also Daso's Builders' and Contractors' Elevators. Steam Fittings and Iron and Brass Castings Furnished to Order.

The working qualities of our machinery at its present state of development as estimated by one of the prominent Brick Manufacturing Companies of Kansas City, are stated in the following reply to a letter of inquiry addressed to them:

KANSAS CITY, MO., August 21, 1888.

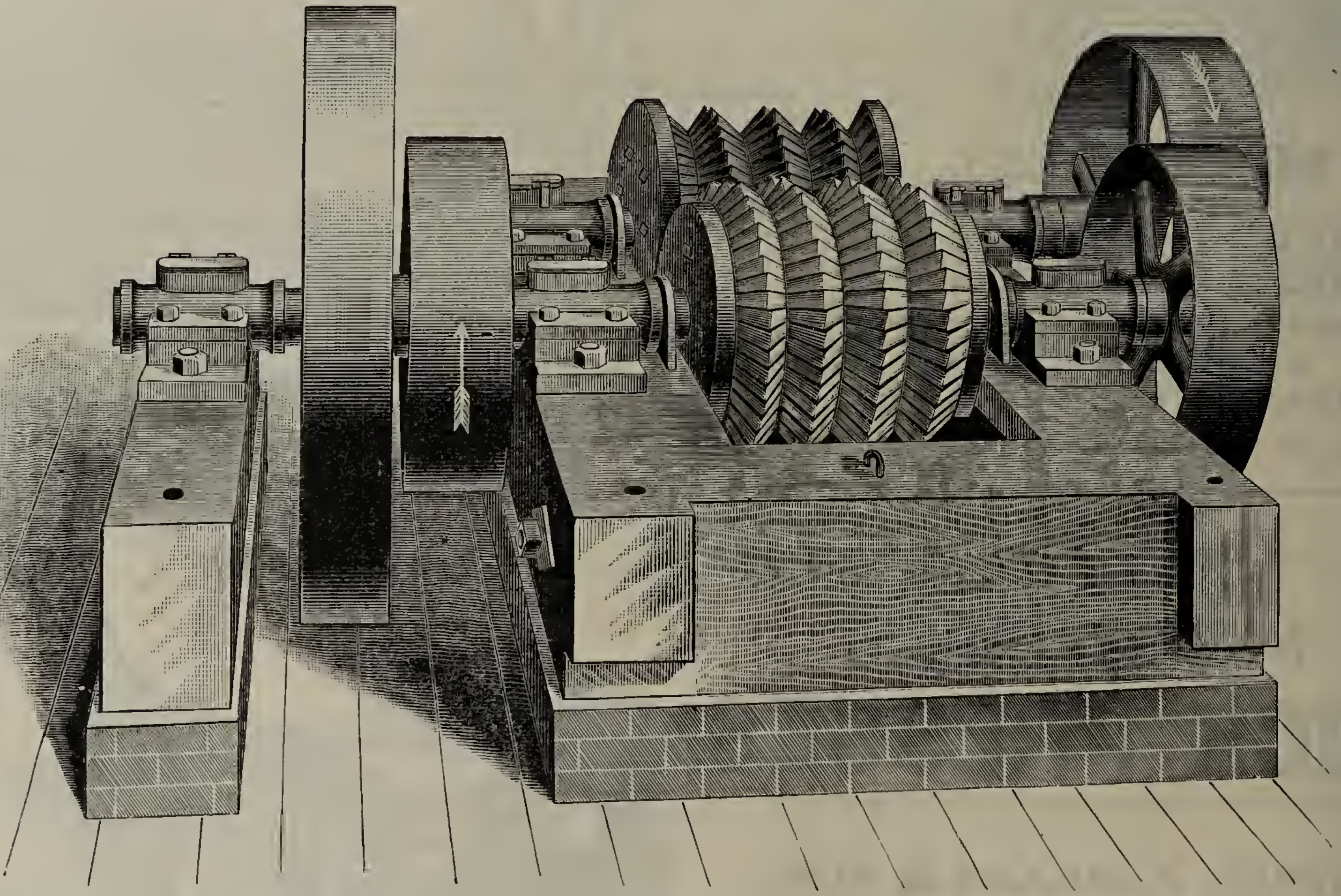
JOHN GIBSON, Esq., Monticello, Iowa:

DEAR SIR—In answer to your favor of the 16th will say, that we do not think there is any room for improvement in the Adrian Brick and Tile Machine Co's No. 4 Cut-off Table, as it cuts the brick as near perfect as possible, without tearing the edges; thus leaving the ends of the brick as perfect as the face. We are also using the new dies on both our machines, and are well pleased with them, as they are 100 per cent. better than the old style and turn out a perfect column of clay without warping or twisting. We have two No. 3 McKenzie machines and they are doing excellent work for us and we averaged during July, 26,800 brick, each, per day. In conclusion we will say that both the new tables and the new dies are so incomparably superior to the old ones that it gives us much pleasure to recommend them.

Very truly yours,
SEDDON & EDWARDS BRICK CO.

NEWELL IMPROVED CLAY PULVERIZER

We Guarantee the Material and Workmanship and allow a Trial of our Machine to any Responsible Party.



NEW 19-INCH LETTER C PULVERIZER, WITH HOPPER REMOVED.

Heavy Cold Rolled Shafts running in best Anti-Friction Metal Bearings, protected from dirt.

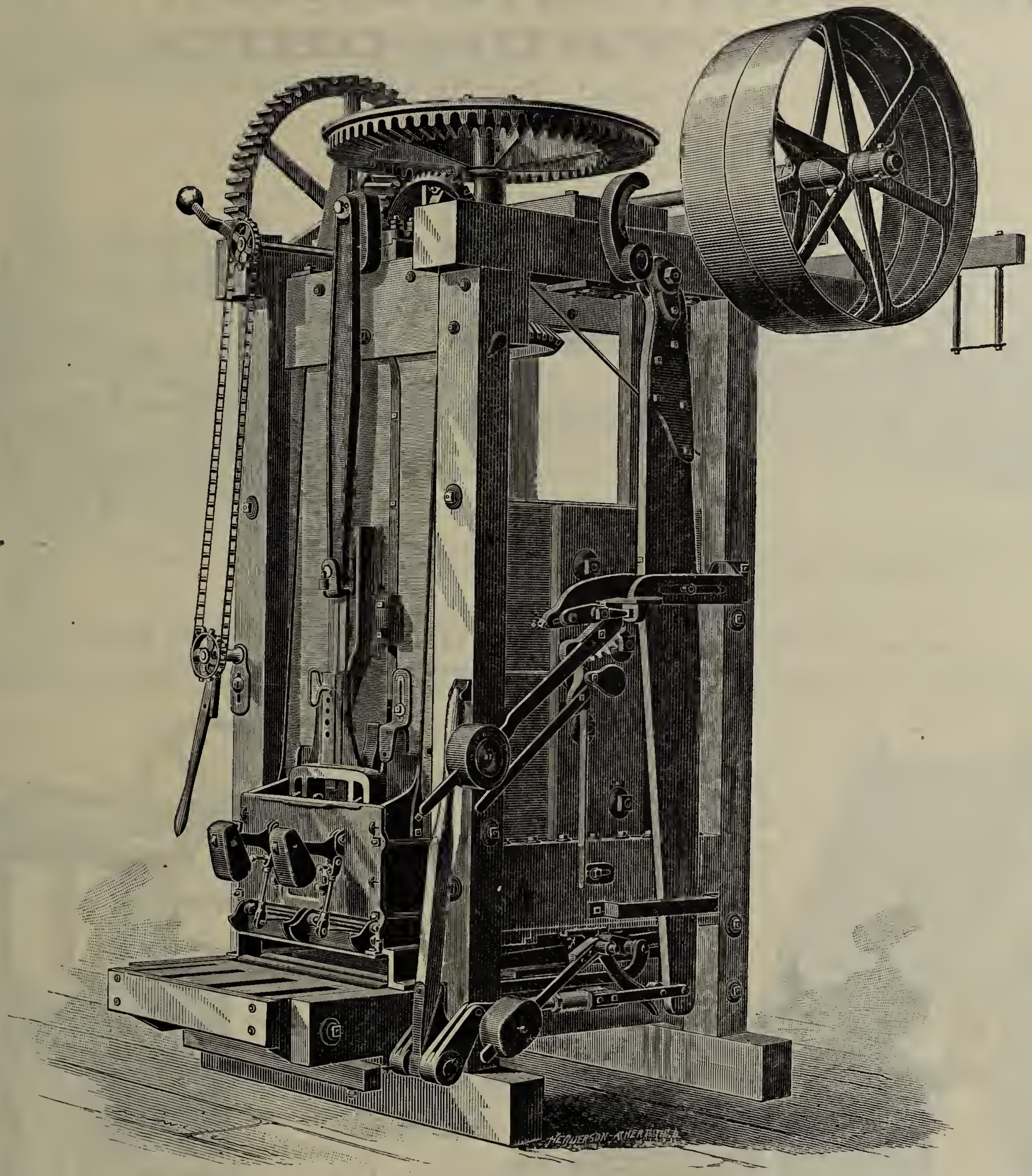
A FEW OF OUR CUSTOMERS AND REFERENCES:

Henry Maurer & Son, (3 Pulverizers) 420 E. 23rd St., New York City.
Peerless Brick Co., Philadelphia, Penn.
Perth Amboy Terra Cotta Co., (2 Pulverizers) Perth Amboy, N. J.
Syracuse Pressed Brick Co., Syracuse, New York.
Potomac Terra Cotta Co., (2 Pulverizers) Washington, D. C.
Siner & Brother, Frankford, Penn.
W. H. Perot, Baltimore, Md.
The Rathbun Co., Deseronto, Ontario, Canada.
Murrill Dobbins, (3 Pulverizers) Philadelphia, Penn.
American Brick & Tile Company, Phillipsburg, New Jersey.

Send for Illustrated Circular and Price List.

NEWELL UNIVERSAL MILL CO., - 10 Barclay St., NEW YORK.

The "Tiffin" AUTOMATIC Brick Machine



The "Tiffin" **Automatic** Brick Machine is, **beyond question**, the best machine of its class in the market. It is **Heavy, Strong, and Durable. IT IS GUARANTEED TO DO GOOD WORK.**

The **"TIFFIN"** is made for use by **Steam**, or **Horse** power. The capacity of the **Horse Power Machine** is 18,000 to 20,000 per day, and of the **Steam Power** 25,000 to 40,000 per day, according to the speed at which they are operated.

Both styles are equipped with our **Automatic "Stone Doors,"** which permits a stone, or any other hard substance, that may have passed in with the clay, to pass out **without breakage to the Machine.**

PRICES:
Steam Power Machine - - $350.00
Horse Power Machine - $250.00

The principal shafts are of Steel, and all other material used, is **First Class. Competent Workmen Only Employed** in their construction. These machines have been **Thoroughly Tested** in the hands of **Experienced Brickmakers** during the past season, and with the most **Satisfactory** results to them. Parties who may be **Interested Enough** to wish to make inquiry, will be given the names and address of the parties who have had them in use.

We are the makers of the **CELEBRATED "OLD RELIABLE"** Brick Machine, for use by hand power, which is so well and favorably known to the Brickmakers of the entire country. We are also manufacturers of Turn Tables, Trucks, Wheel Barrows, Molds, Kiln Doors, Etc., Etc. Correspondence solicited.

TIFFIN AGRICULTURAL WORKS,

[Mention the Clay-Worker.]

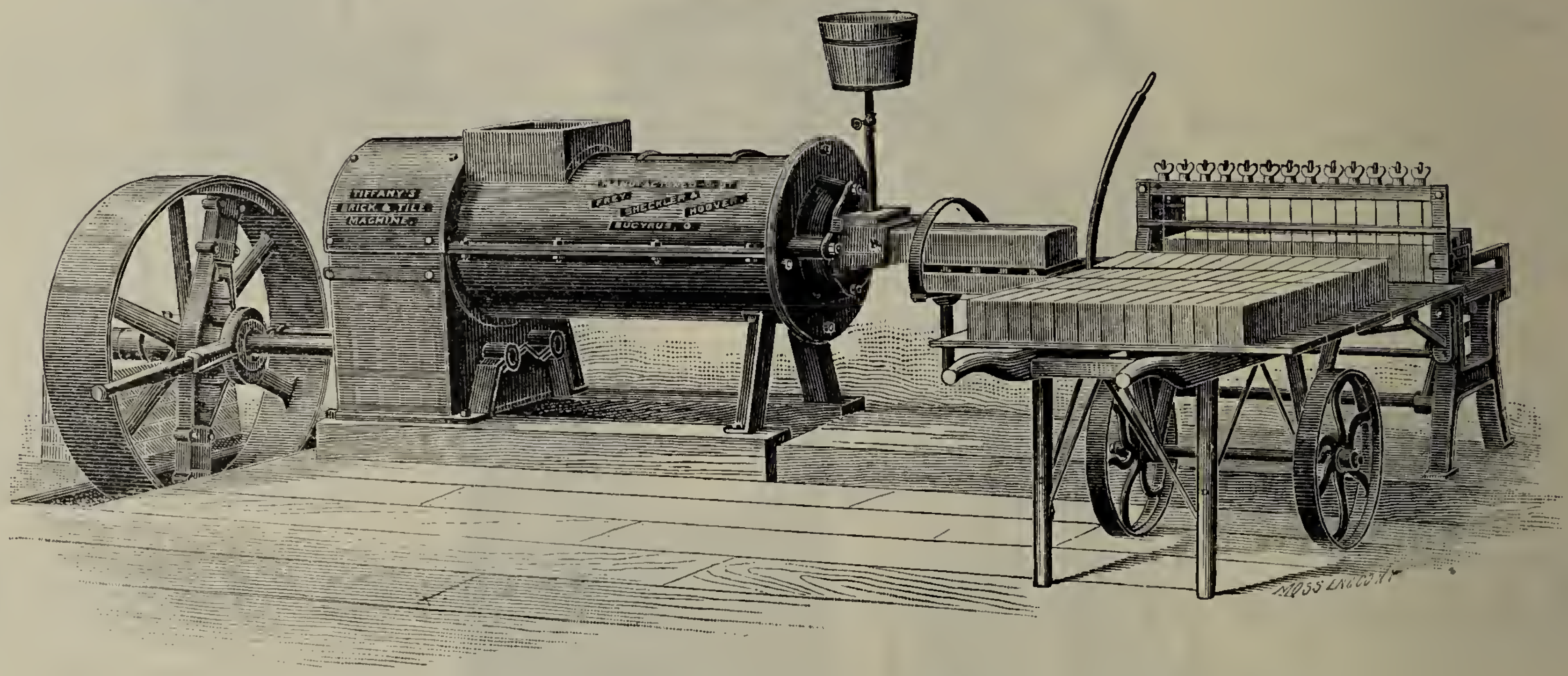
TIFFIN, OHIO.

THE FREY, SHECKLER CO.

BUCYRUS, OHIO.

With increased facilities threefold.

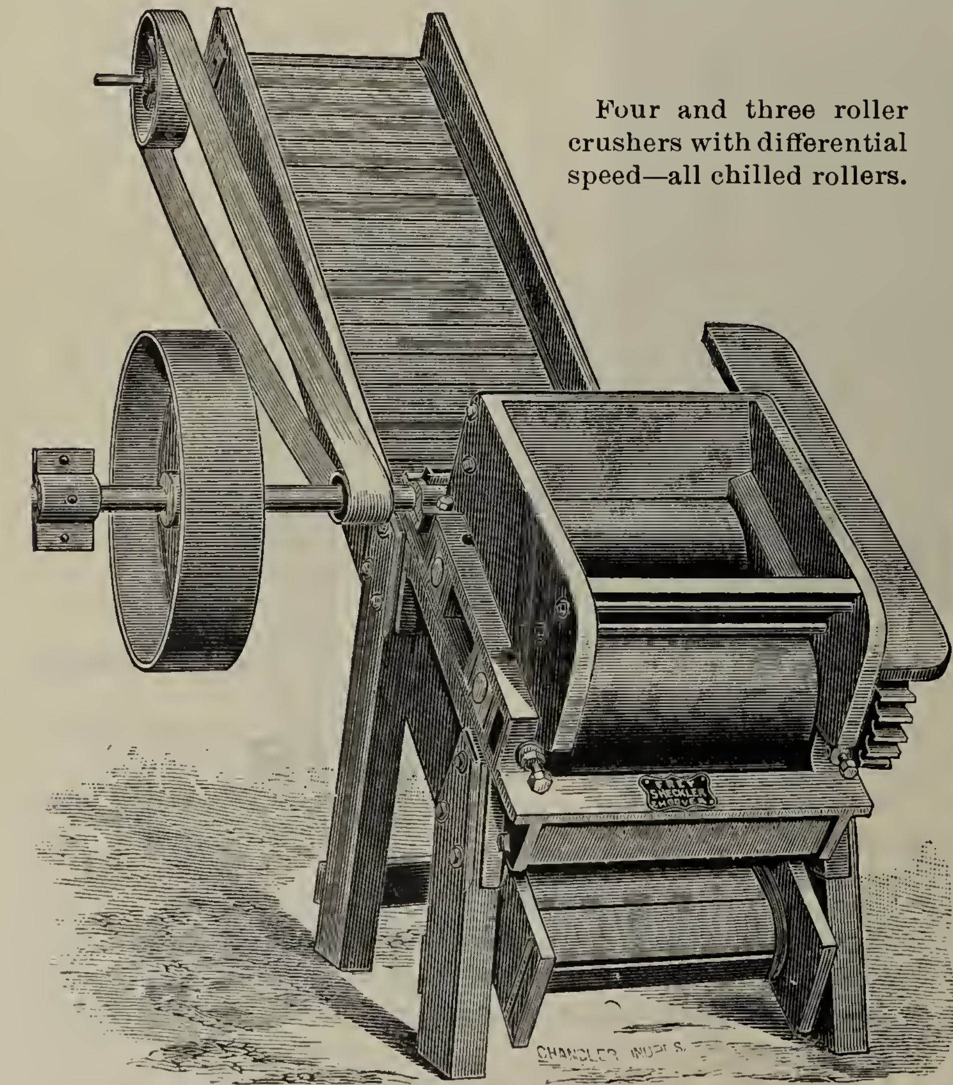
Seven different brick machines. Four different tile machines. Will make any quantity of brick or tile as desired.



The Mascot for light power and low in price.

CUT OF CENTENNIAL WITH SELF-LOADING ATTACHMENT ON CUTTING TABLE.

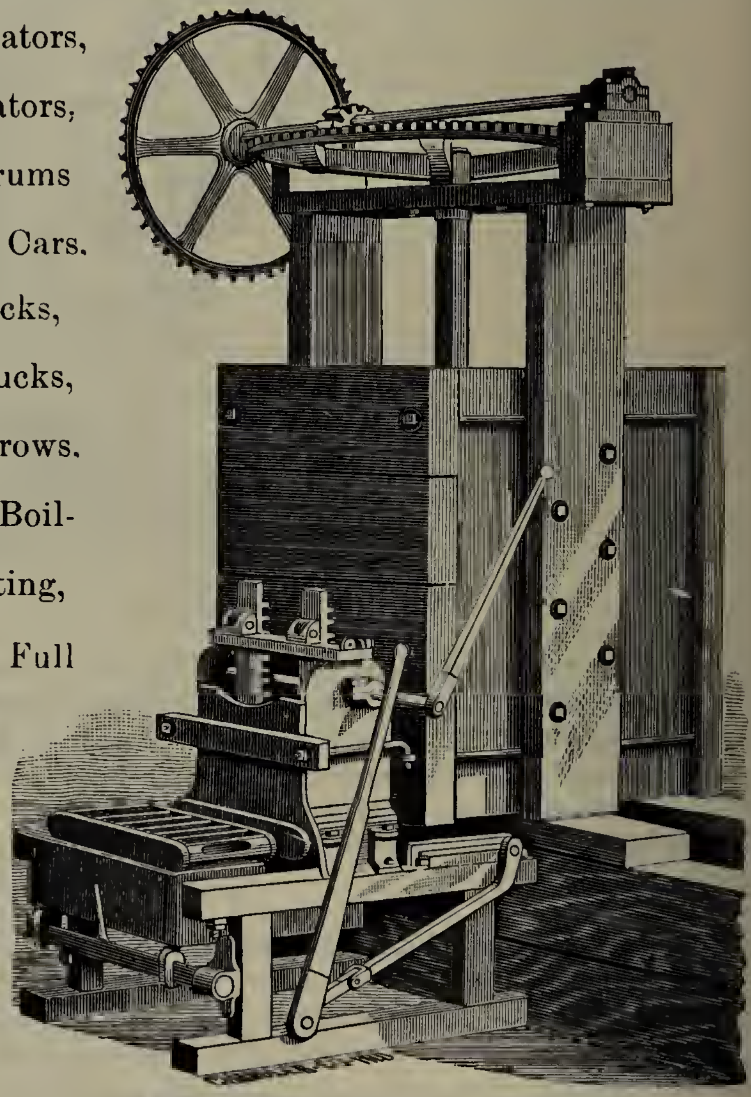
The above cut shows the Board Delivery Cutting Table which loads the brick automatically on special trucks in connection with the Centennial Tiffany Machine and Patent Lubricating Brick Die. Acme Special Brick Machine, largest capacity. The Duplex, 80,000 brick per day.



Four and three roller crushers with differential speed—all chilled rollers.

We make thirteen different patterns of Roller Clay Crushers. All rollers best chilled iron.

Clay Elevators, Tile Elevators, Steam Drums and Dump Cars. Tile Trucks, Brick Trucks, Wheelbarrows. Engines, Boilers, Shafting, Pulleys. Full outfits for Brick and Tile Factories and Fire Clay Works.



The Eagle Brick Machine.

Cheapest and Simplest for Horse and Steam power

(16,000 brick per day.)

PLANS FOR KILNS FURNISHED CUSTOMERS.

Send for illustrated circulars to

The FREY, SHECKLER CO., Bucyrus, Ohio.

AN OPEN LETTER.

FRANKFORT, IND., 1889.

TO CLAY WORKERS:

GENTLEMEN:—This being my second anniversary I take pleasure in thanking those that have given me employment end trust that in the main I have met your entire expectations. Those that are disappointed in me I think did not understand my disposition. I forgive my tormentors for the many things they have said against me, but I stood the storm and am glad they recognized me as one of them. To those that think I am not large or strong enough for their work in the great battle of bricks, I will refer them to my brother the BIG WONDER, that I know will suit them. For my benefactors I must say, they have watched me with a jealous eye and corrected me in many of my weaknesses and are so well pleased with my conduct that they start me out this year with an entire new suit of clothes, and they have not failed to strengthen the parts that were rent in my old one, in which I will appear in the next issue of this paper. I am

Most Truly Yours,

The LITTLE WONDER Terra Cotta Lumber Brick & Tile Machine,

Manufactured by THE WALLACE MFG. CO.,

Write for particulars.

FRANKFORT, IND., U. S. A.

SUCCESS, HARD SOUGHT AND WELL EARNED

In 1883, the year in which

THE AUTOMATIC

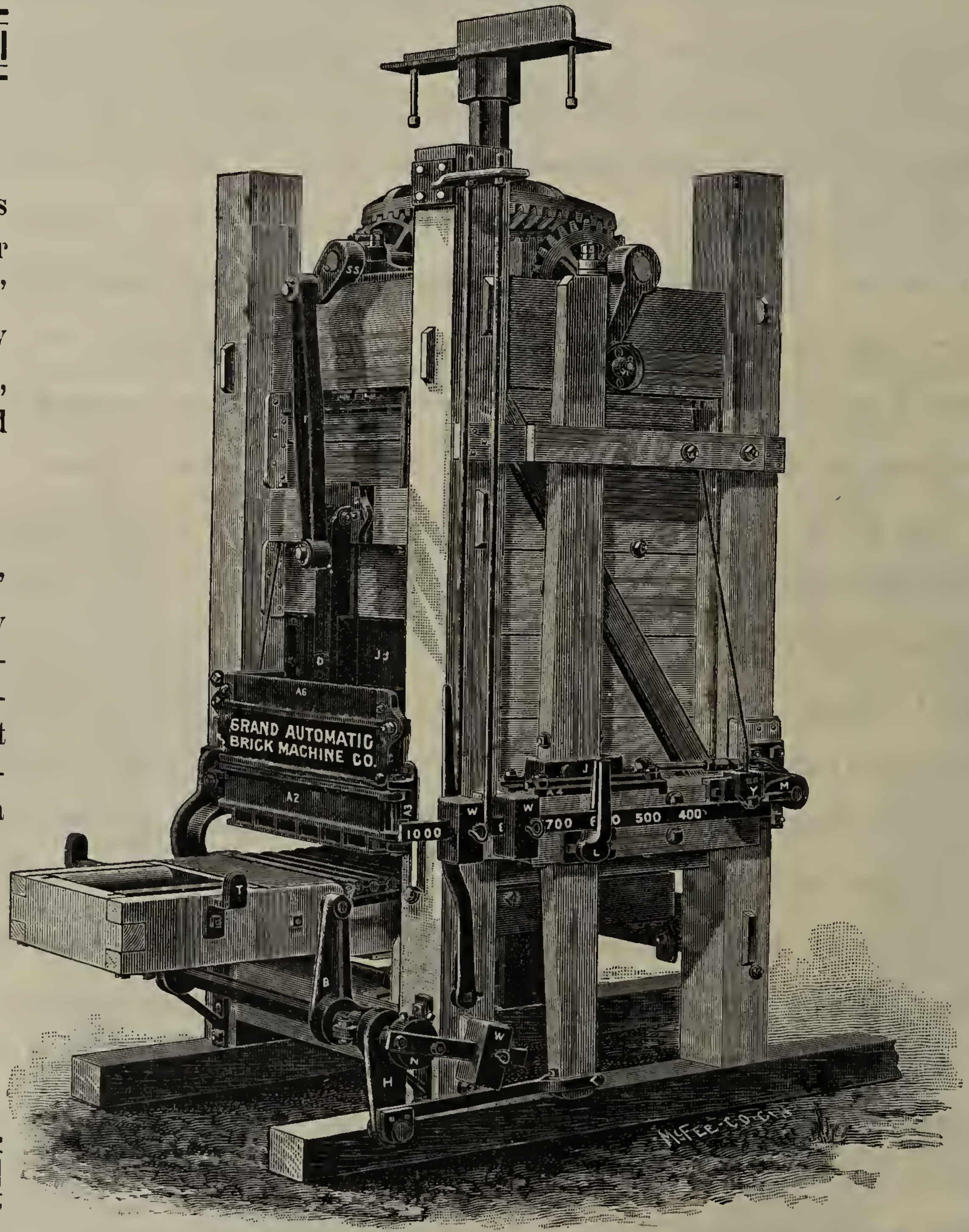
Was born, one very conceited brick machine manufacturer remarked to another that "Creager wouldn't last long and needed no consideration."

In 1886

These manufacturers found that "Creager and the Automatic" was a decidedly healthly combination, and certainly needed watching.

In 1887-88

The "Automatic" being reinforced by other desirable additions, and the wholesale way in which it was ousting the inferior machines, was a substantial evidence that we meant business, and not being able to handle us individually, combinations were formed to give us a black eye.


GRAND AUTOMATIC BRICK MACHINE CO.
1000
700
500
400
McFEE-CO-CIN

In 1889,

JUST NOW, we certainly notice, with an increased feeling of satisfaction, that the miscellaneous warfare is ended, and all attention will now be bestowed upon the

Grand——
—Automatic,

Whose marvelous strides of the past five years must be stopped or the "LITTLE MACHINES" must be laid quietly to rest. One man of the road was but recently heard to remark, "Henceforth it shall be my whole aim to down the 'Automatic,' and I intend to fight it straight from the shoulder.

To all who desire the BEST BRICK MACHINERY manufactured we extend a cordial invitation for correspondence.

The Grand Automatic Brick Machine Co.,

CINCINNATI, OHIO.

Next Month the Barber-shop.

CHAMBERS BROTHERS CO.,

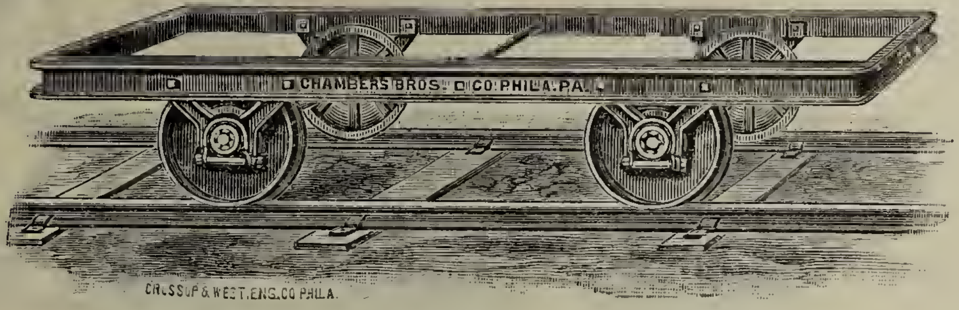
FIFTY-SECOND ST., BELOW LANCASTER AVE,

PHILADELPHIA, PA.

Improved Tunnel Dryers For Common Brick

And the Most Durable and Complete System for Transporting Green Brick.

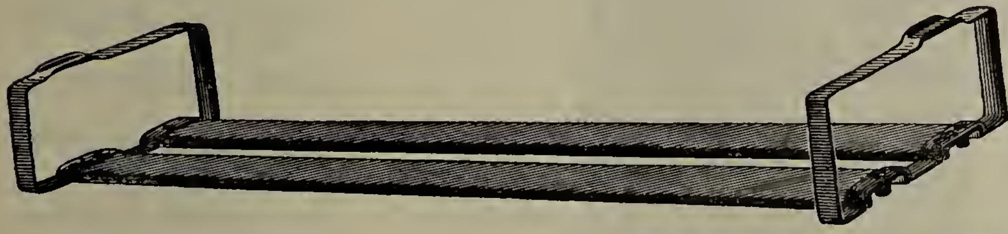
The Strongest Car Made.


CHAMBERS BROS. CO. PHILA. PA.
CHESSUP & WEST. ENG. CO PHILA.

The Strongest Car Made.

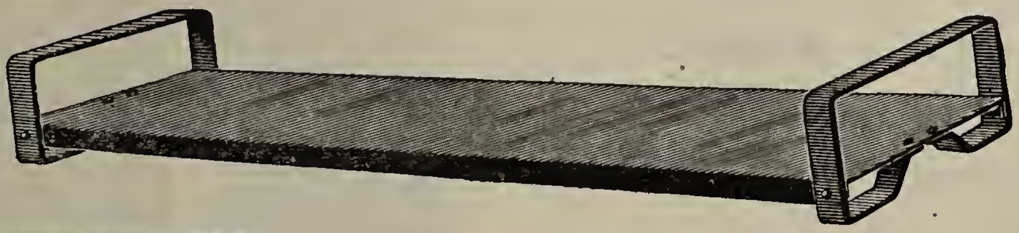
CHAMBERS' WROUGHT-BODY DRYER CAR.

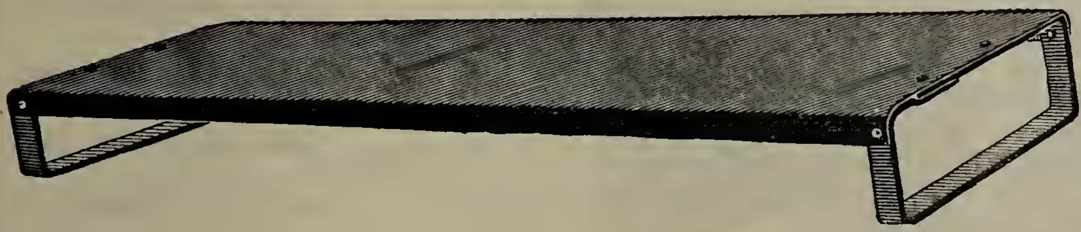
A lower priced Car with cast iron bodies made to order.



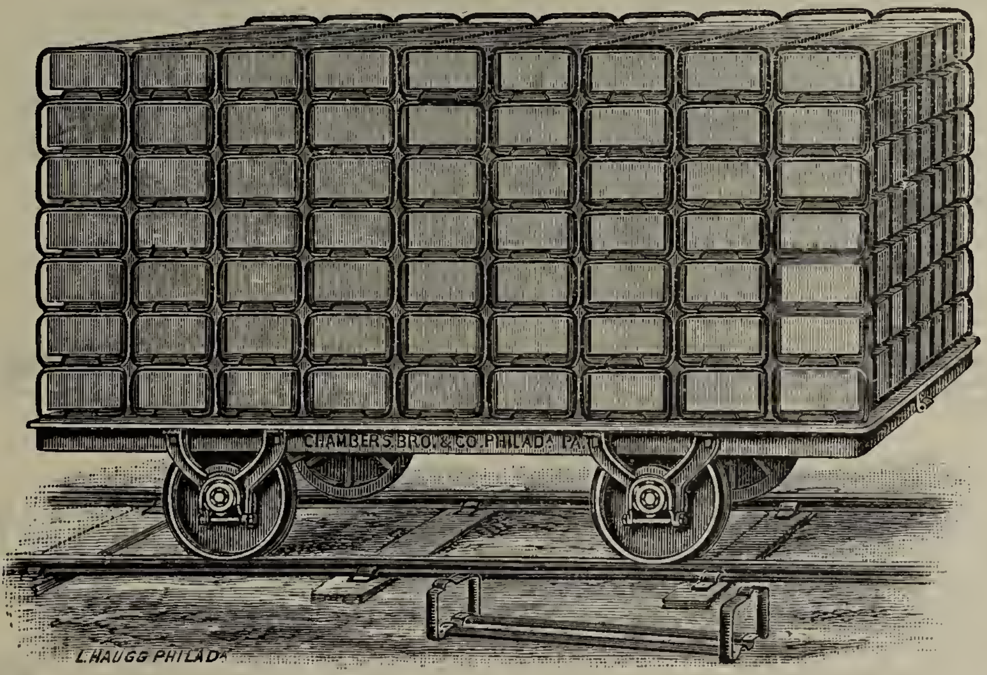
Wrought Iron Interlocking Pallet for Stiff Tempered Brick only.

Steel Pallet for brick placed on flat side or on edge.





Steel Pallet for soft moulded brick, or those placed on flat side only.


CHAMBERS BRO. & CO. PHILAD. PA.
L. HAUGG PHILAD^A

CHAMBERS BROTHERS COMPANY,

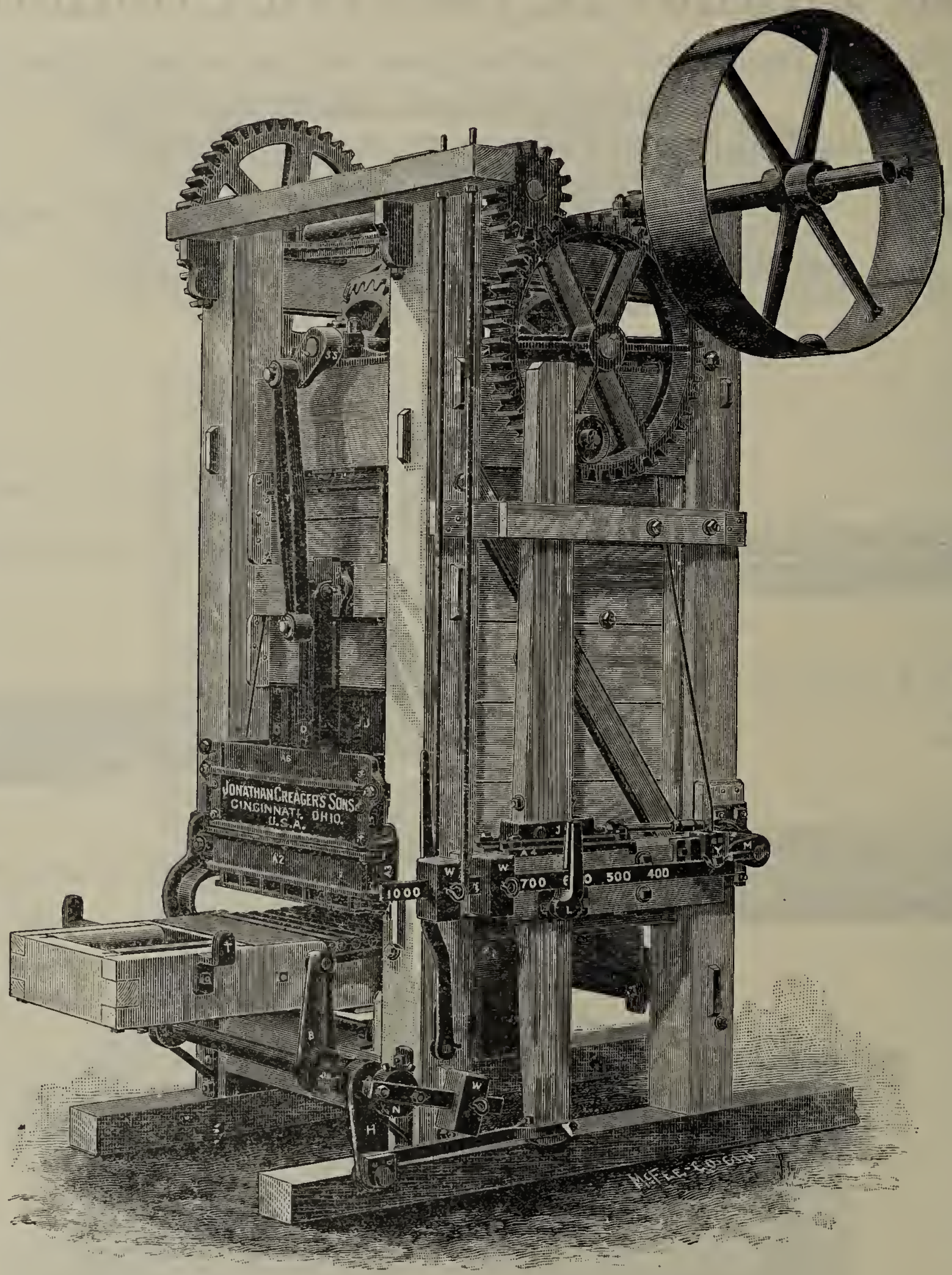
PHILADELPHIA, - - PA.

☞See ad. on front cover page.

[Mention the Clay-Worker.]

Beware of Counterfeits!

We are in receipt of information (of course we can not positively swear to its veracity), that certain manufacturers of a hitherto 'special' line of clay-working machinery, have now about completed and will soon put upon the market a Brick Machine "ALMOST AS GOOD AS THE AUTOMATIC" and desire all Brick-makers to withhold their orders until this mechanical marvel makes its appearance. We certainly feel very proud to know that we have a machine worthy of such close imitation. However, WE always LEAD and expect IMITATORS to follow and partake of such of our good qualities as are not covered by LETTERS of UNCLE SAM. We admit that the power of persuasion is great, and the organs of the imitators are doing their level best, but every brick-manufacturer who values time and money will not allow himself to be taken in, when the "SIMON PURE ARTICLE," THE ORIGINAL AND ONLY GENUINE



GRAND AUTOMATIC

Can be obtained from the Inventors and Leaders,

JONATHAN CREAGER'S SONS, CINCINNATI, OHIO,

MANUFACTURERS OF

A Complete Line of Most Improved and Modern Brick Machinery for Producing Superior Brick on a Large or Small Scale.

Correspondence, Comparison and Investigation is earnestly solicited. Come to Cincinnati, become acquainted.

MORRISON'S
IMPROVED KILN

FOR -:- BURNING -:- CLAY -:- WARES

Especially adapted to Burning Common, Repressed and Ornamental Brick.

PATENTED IN UNITED STATES AND CANADA.

SUCCESSFUL! DURABLE!

Daily product of our Kilns in the United States, One-Half Million Bricks. Our claims fully substantiated BY OUR PATRONS. We claim ninety to ninety-five per cent. hard brick. Arch bricks all Fronts and Pavers and none damaged—of uniform color. Pressed brick burned without fire-marks—coal screenings preferred for fuel. One fireman for two hundred thousand bricks. The

Only Kiln That Regulates the Temperature of Heat

And directs its course by a system of air drafts, giving complete control of the degree of heat, as well as its manipulation. This system we have covered by letters patent. Any persons using these air drafts are liable to prosecution for infringement.

Read the following testimonial from a recent patron, and another new one from an old patron:

Knoxville, Tenn., October 31st, 1888.

R. B. Morrison, & Co., Rome, Ga.:

GENTLEMEN—I have used your *Improved Kilns* during the past twelve months and cheerfully report the result. We burn our bricks in your Kiln at a cost of sixty-five cents per thousand for fuel and labor; a saving to us, over our old method, of eighty cents per thousand on the two items. My saving in waste brick in the kiln and at the building is fully *ten per cent.*, or sixty cents per thousand in other words Every time I burn your kiln of 300,000 bricks it is a saving to me of *more than four hundred dollars* over the old process. I find your kiln durable and simple to operate. We use coal screenings for fuel. Have no waste in arches, and burn ninety per cent. hard brick. I have no hesitation in pronouncing your kiln a success in every respect, as you make no claims it does not fulfill. Yours Truly,

REPS. JONES.

Atlanta, Ga., July 20th, 1888.

R. B. Morrison & Co., Rome, Ga.:

GENTLEMEN—We have used your Improved Kilns for three years and during that time have burned upward of a hundred millions in them and wish to emphasize our former statement in regard to your kilns. They are reliable, durable, and the best kilns for our purpose, we have been able to find after investigating many of the various kilns in use, and say to our friends of the trade: If you want kilns that will burn your brick nearly all hard, and do it every time, burn them economically and without loss, and with little cost for repairs, secure the Morrison Kiln. CHATTAHOOCHEE BRICK CO., per GEO. W. PARROT, Vice-Pres.

—WE SELL OUR KILN STRICTLY ON MERIT—

☞For descriptive circulars, additional testimonials, and all information desired, address

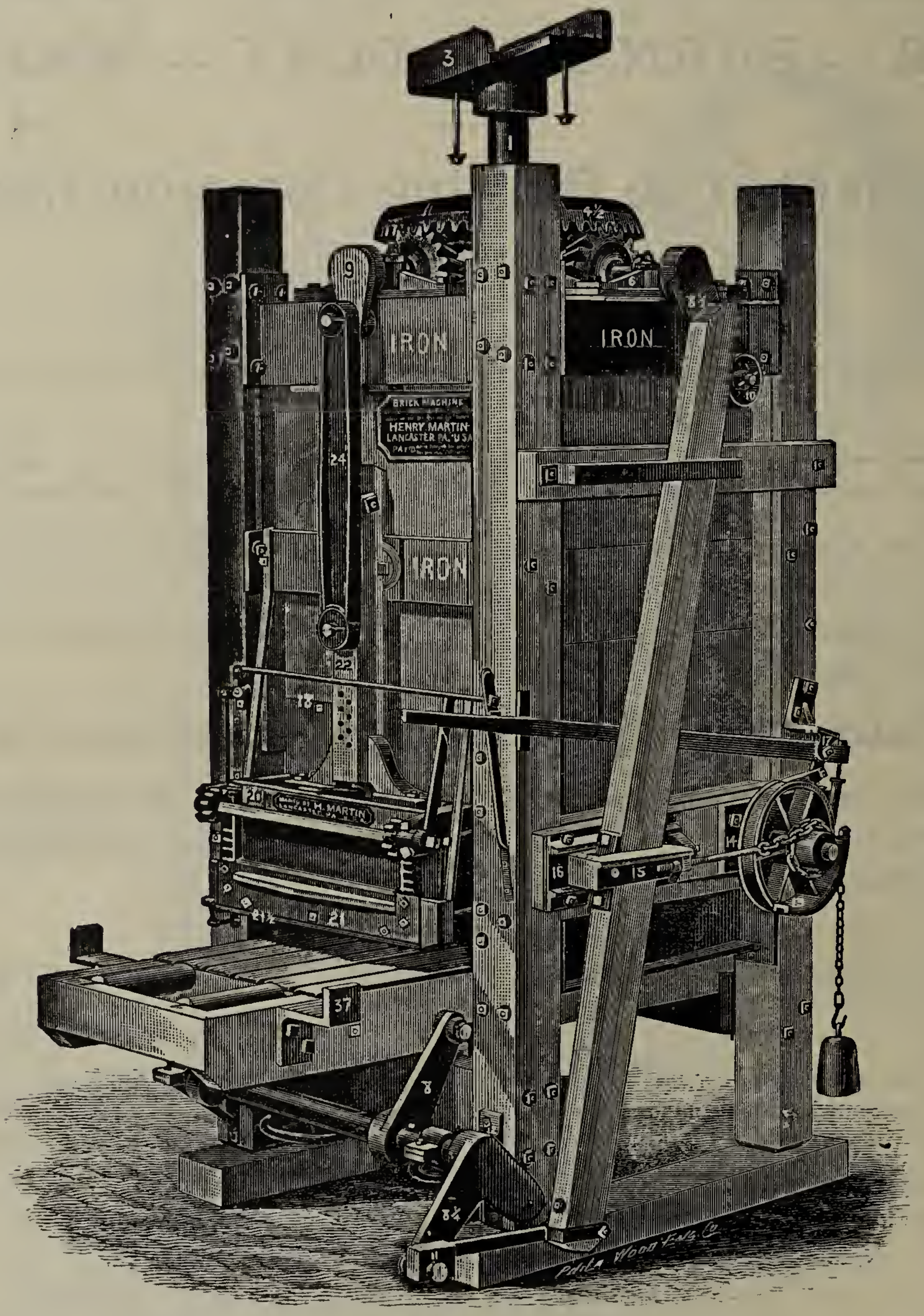
R B. MORRISON & CO.,

Box 335, - - - - ROME, GEORGIA.

The Henry Martin Brick Machine.

For Steam or Horse-Power.

FOR STEAM OR HORSE-POWER.



FOR STEAM OR HORSE-POWER.

This cut represents our Horse-Power Machine. It has Iron Rails. It is the strongest. It is the best. It is the most simple. It is the most perfect. It does the best work. It works any clay. It does not get out of order. It is not liable to break down. It stands hard usage. It can be changed to Steam Power.

BETTER THAN EVER.

Our machines are this season the Best ever built by our Mr. Henry Martin, whose thirty years' experience has rendered him familiar with the wants of the Trade.

For Strength, Durability, Qoantity of Output and Quality of Work, they have no equal.

Brickmakers make no mistake when they buy the Henry Martin Machine.

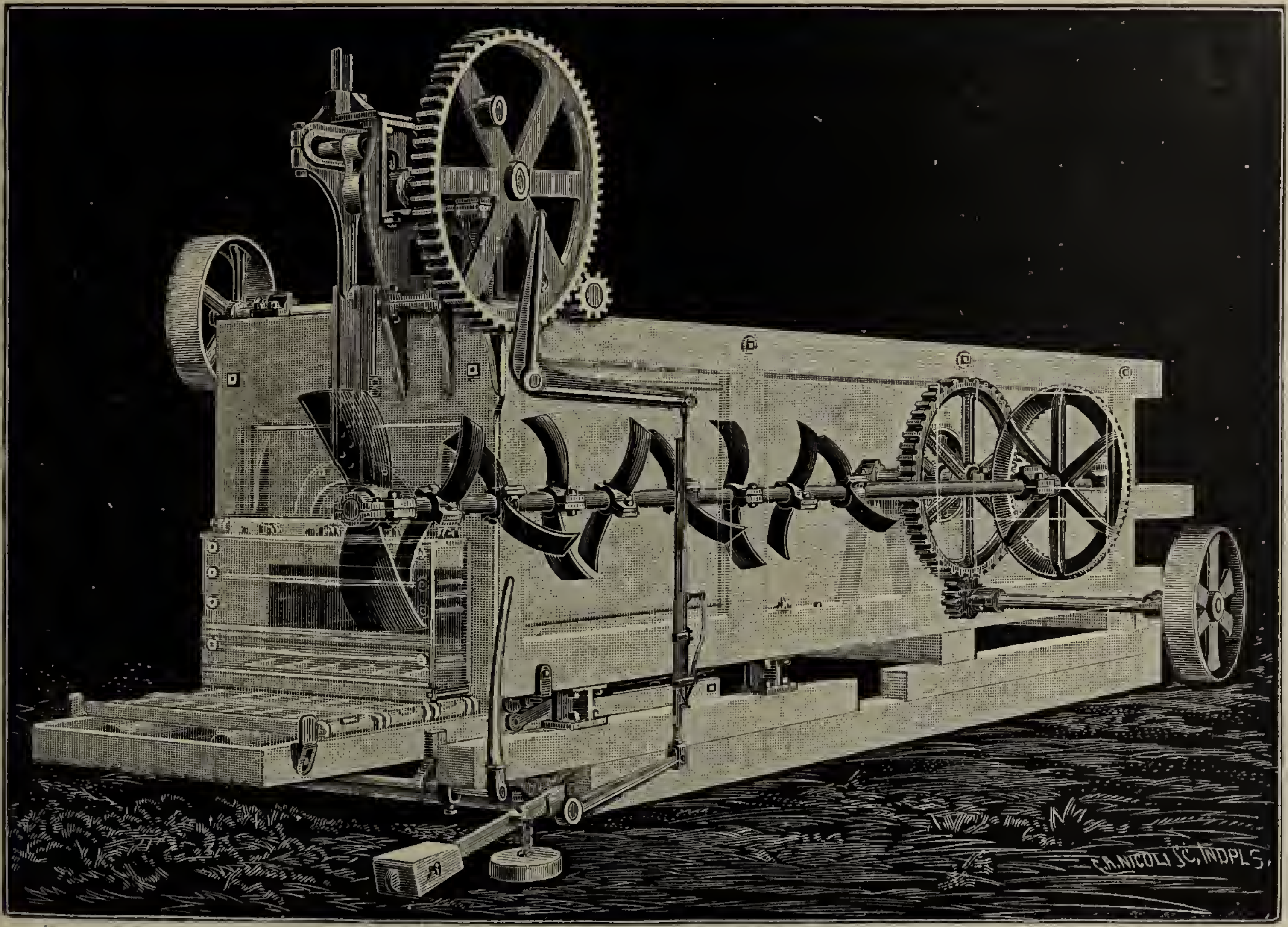
—MANUFACTURED BY—

The Henry Martin Brick Machine Mfg. Co.,

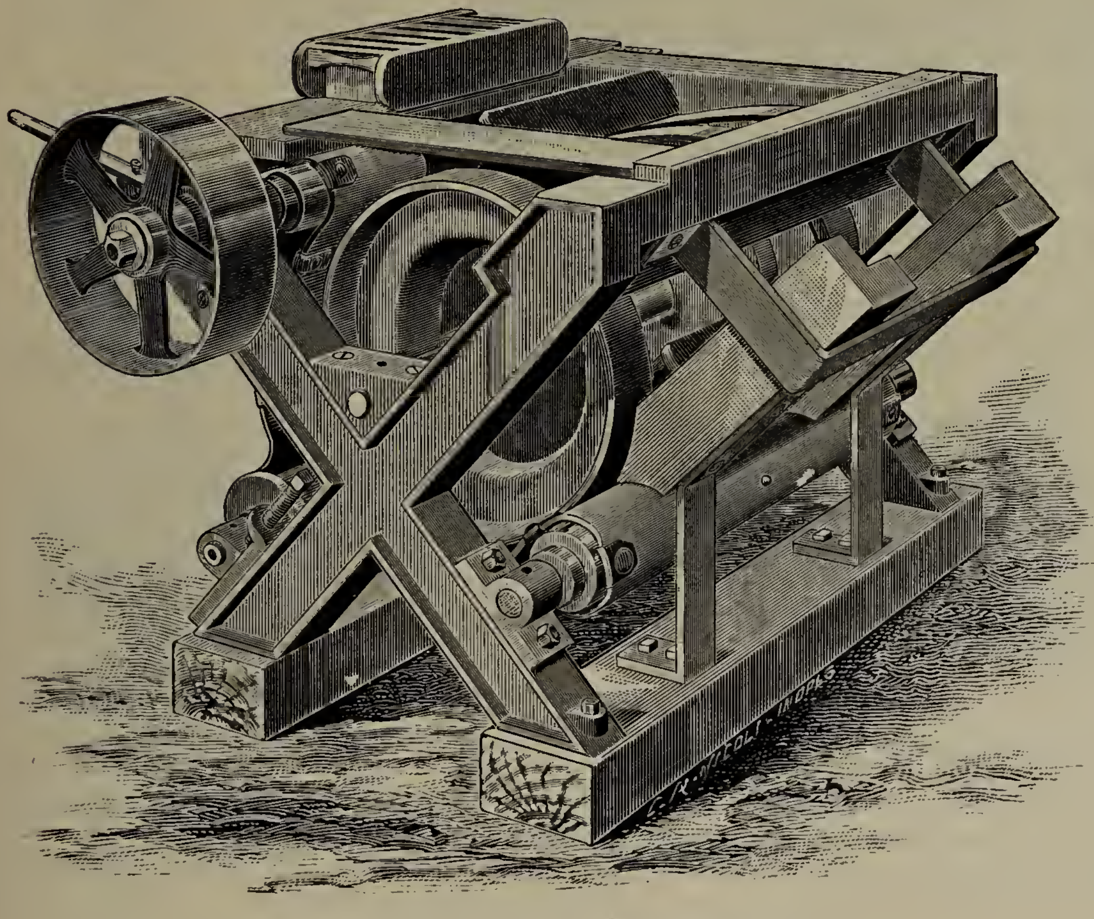
Send for a Catalogue.

LANCASTER, PA., U. S. A.

☞ LOOK AT THIS, BRICKMAKERS.


C.A. NICOLI SC. INDPLS.

THE POTTS STOCK BRICK MACHINE.



The Potts Improved Mould Sander.
PATENTED FEB. 5TH, 1889.

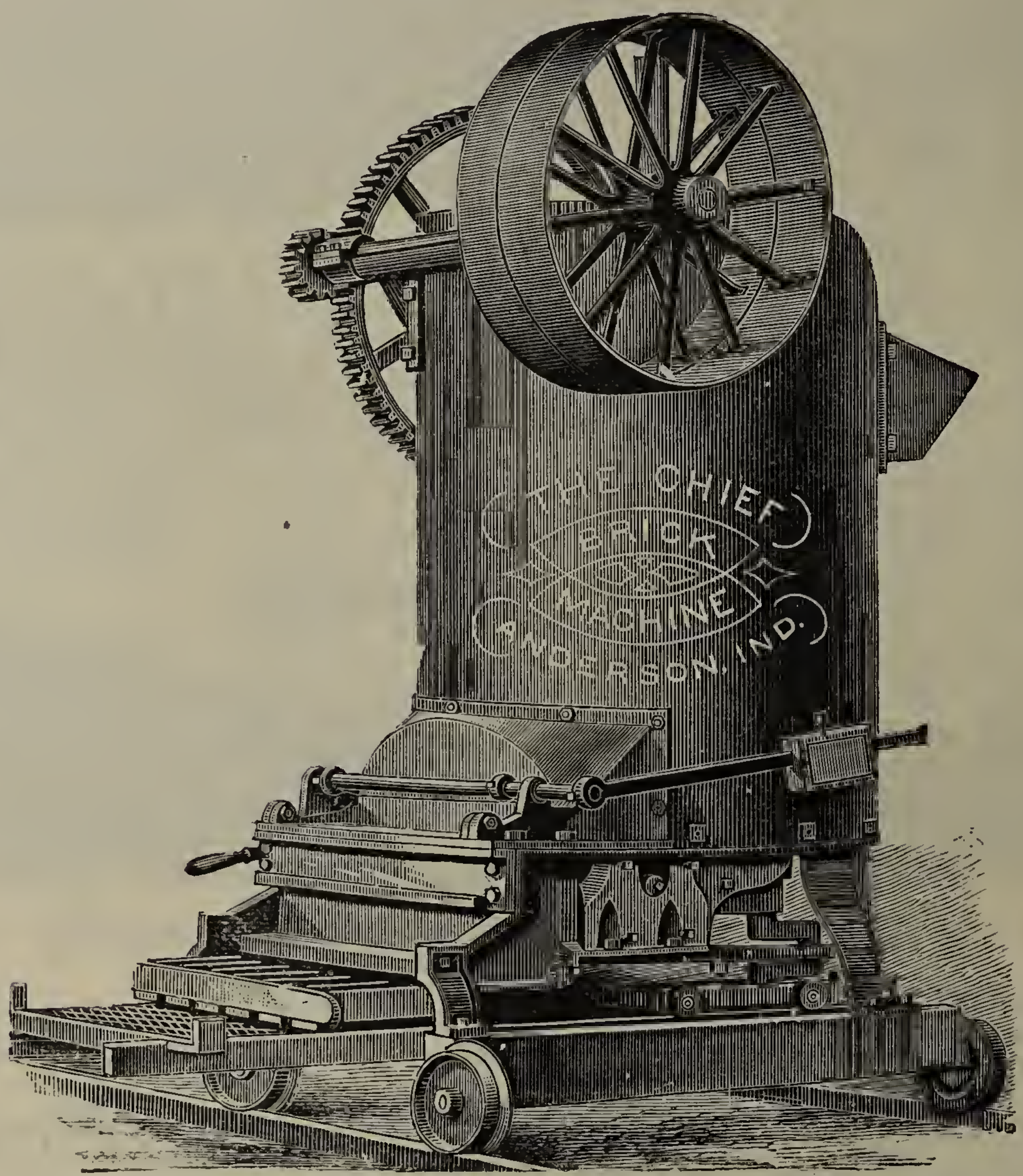
The three essentials:
SIMPLICITY,
STRENGTH,
DURABILITY,
are here combined in
a perfect machine.

Don't forget that we manufacture the best of all Clay Disintegrators and a full line of clay-working machinery.

☞ Send for special circular with full description and prices.

C. & A. POTTS & CO., 418 to 428 West Washington Street, INDIANAPOLIS, IND.

THE NEW IMPROVED
CHIEF BRICK MACHINE.



Patented Jan. 1, 1884, *April* 2, 1884, *and the new improvements of* 1887 *and* 1889.

Has taken the lead and stands at the head of all Brick Machines, and is now in operation in every State and Territory in the Union.

In its original construction it was exhibited and operated at the great Southern Exposition at Louisville, Ky.; also at St. Louis, Mo., Kansas City, Mo.; Indianapolis, Ind.; Columbus, O.; Cincinnati, O.; Chicago, Ill.; and at each and all places where premiums were awarded the CHIEF carried off the first prize medal over all competitors.

And with the late new improvements added the CHIEF stands in perfection, at the head of human inventions.

The NEW IMPROVED CHIEF is wonderful in operation, is all steel and iron, and of the greatest strength and durability, is easily operated, and with two horses or a small engine makes 60 to 100 perfect bricks per minute. Grinds, tempers and at the same time moulds into brick any clay. Stones in clay cannot break it, nor interfere with its free operation. It is easily transported, and changed from horse to steam power. It fills the moulds evenly and well until the machine is empty of clay, pressing each brick equally and solid, so all will shrink alike. The pressure can quickly be changed while the machine is running to suit the consistency of the clay. All shafts are of steel; main shaft runs in three boxes or bearings all outside of the machine into which mud or sand cannot penetrate. The wear can at all times be taken up so as to prevent leakage. The clay in the press box is under full control of the plunger, which is direct and positive, and prevents the mud from floating back into the mud drum; this feature is not found in any other mud machine.

Bricks made by the NEW IMPROVED CHIEF, are solid and perfect, and have sharp edges and corners, and do not crumble in burning.

The NEW IMPROVED CHIEF is equally suitable either for small or large yards, the best of bricks are made by it at the least labor and expense, all parts are easy of access and the bearings can be oiled from the outside. All ordinary sizes of brick as well as ornamental brick can be made on the NEW IMPROVED CHIEF and it is especially adapted to making fire brick of any shape.

The NEW IMPROVED CHIEF is sold on its merits, and warranted to be all that is claimed for it.

We will send Circulars and Testimonials of the NEW IMPROVED CHIEF BRICK MACHINE, New Departure Tile Machine, Engines, Etc., Etc., free to any address on application. Address

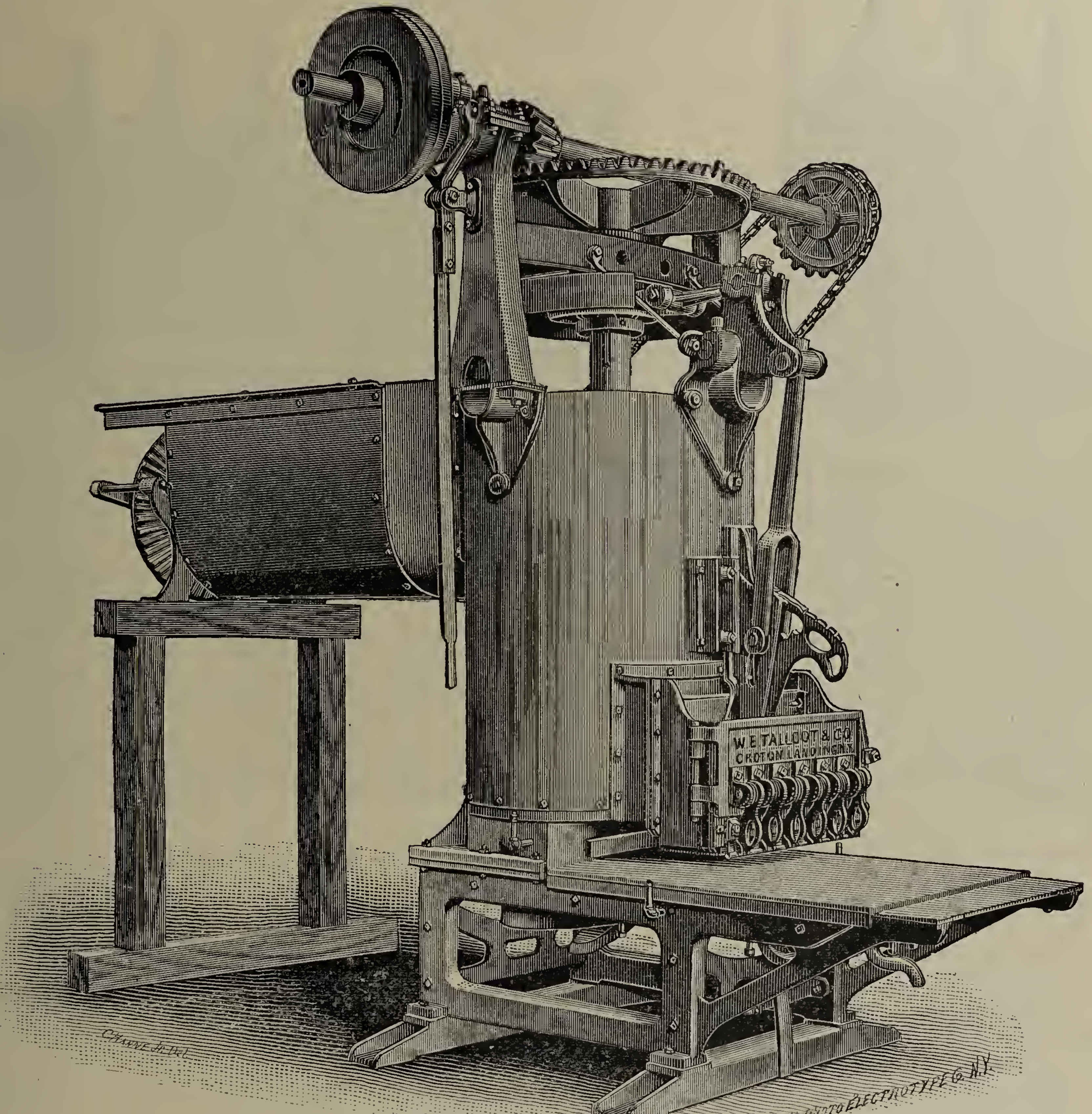
Anderson Foundry & Machine Works,

Anderson, Indiana.

[Mention the Clay-Worker.

W. E. TALLCOT & CO'S.

I. X. L. Brick Machine and Improved Pug Mill.


W. E. TALLCOT & CO.
CROTON LANDING N.Y.
CHAVE Jr. Del.
FRANKLIN PHOTO ELECTROTYPE Co. N.Y.

This is a simple and powerful machine, making a superior brick and possessing advantages over all others. It is the result of years of experience in using and manufacturing brick machines. Among its advantages are *Great Strength, Simplicity and Durability* few parts, well protected from sand, yet easy of access for adjustment, renewal and repair. No wood is used in its construction; it is made all of iron and steel. Perfect automatic action to prevent breakage by stones or other obstructions. Great tempering capacity and ability to mould very stiff clay. It is easily understood, easily operated, easily kept in order. Quality of brick made, unsurpassed

The I. X. L. is eipecially designed and built for heavy work. Weight of Machine and Pug Mill 10,000 pounds. Weight of Machine without Pug Mill, 7500 pounds. Send for circular and prices.

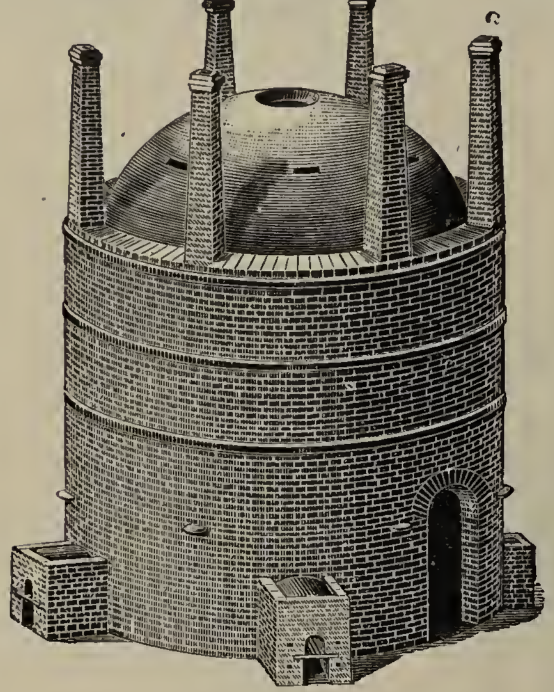
It will pay you to use the I. X. L.

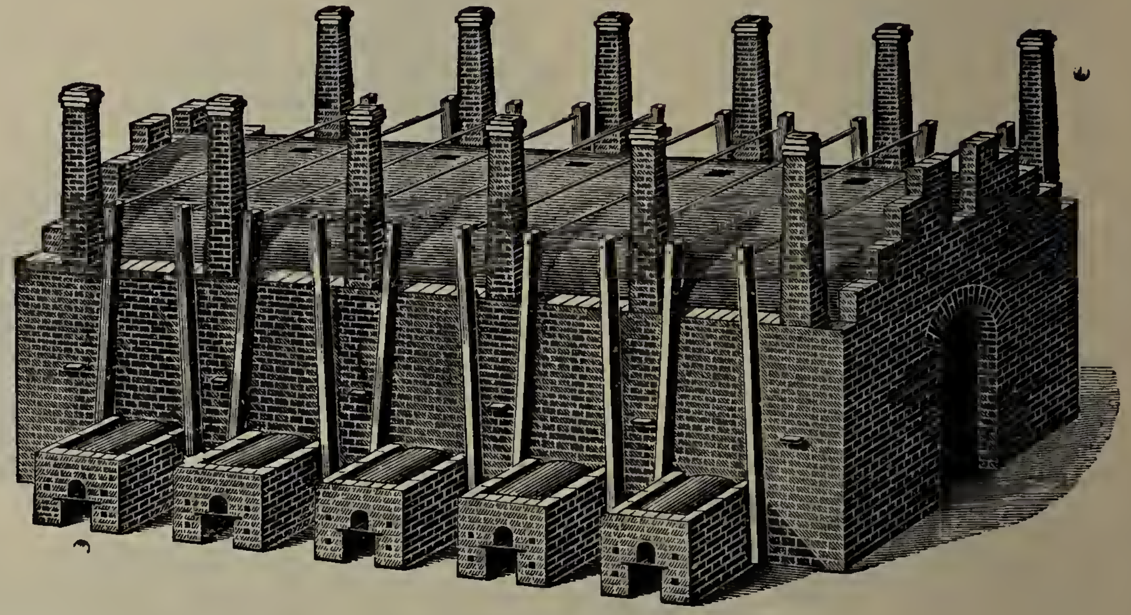
W. E. TALLCOT & CO.,

Croton Landing, New York

THE EUDALY KILN.

BURNS ANY KIND OF CLAY OR WARE.





THE DOWN-DRAFT KILN.

UNIFORMITY IN BURNING is without a doubt the most essential feature to clay workers. Especially is this the case with fine clays where it is desired to have the wares of uniform color, size and hardness.

In the construction of these kilns particular attention has been paid to this point, by having first carefully examined the subject of drafts and the strength and nature of the different kinds of fuel. The size of the kiln, the size and number of furnaces, flues and chimneys must always sustain the proper relation to each other for a perfect draft. Too much draft is as dangerous as too little. One of the greatest mistakes of kiln inventors and builders is that they utterly disregard the important subject of drafts.

ABILITY TO DIRECT THE HEAT TO ANY PART OF THE KILN is equally as important as a proper draft. Unless the burner has control of the heat in the kiln he has no assurance of a uniform burn. In these kilns if the burner finds the wares too hot in any portion of the kiln he can in a moment shift the heat to any other part where it is not so hot, or what is better, if he has two or more kinds of wares in the kiln, one of which requires more burning than another, he can easily give that portion of the kiln an extra amount of heat. We claim that this is the only kiln in which these results can be attained successfully.

For this reason wares can be burned by this system **more uniformly** than by any other.

Practically there is no difference from top to bottom, yet this is purely a *down draft* kiln. There are no inside dampers or cut-offs. **Everything about the kiln is permanently built.**

ECONOMY OF FUEL AND LABOR is perhaps the second most important feature of any kiln. We hear a great deal said about "economy in fuel and labor," but to understand what is necessary to a fuel and labor saving kiln one should be thoroughly acquainted with all kinds of fuel and the conditions necessary to get the greatest number of heat units out of it, and at the same time **distribute the heat to the burning wares in the most effective manner.**

We claim that our latest improved furnace is the most **complete economizer** of fuel that has ever been invented.

The construction is purely scientific, and is made by first obtaining the chemical requisites necessary to insure perfect combustion and then building a furnace to bring about these results. Different kinds of fuel require a different size and construction of furnace. We use any kind of fuel, soft coal, screenings, oil, gas or wood.

COST OF CONSTRUCTION.—These kilns require no large stack, which ordinarily costs as much as the kiln proper. Many persons think they must have a large, tall stack in order to have sufficient draft to get the bottom of the kiln burned.

This is certainly a mistaken notion.

The things that are required, however, are a correct location and size of furnaces, flues and chimneys with reference to each other and the kiln. When these are properly attained the burner need have no fear about draft.

In these kilns great care has been taken to adjust these relations in such a way that the expensive stack is not at all required, and a much better draft obtained.

DURABILITY.—Each part of these kilns is built with special reference to strength and durability.

The furnaces, which are perhaps the most perishable parts of any kiln, are in these kilns made very strong and durable.

Those parts most liable to burn out can be easily removed and replaced without damage to the other parts of the furnace.

Rules are given by which a builder of these kilns can get the strongest crown and best supports to the kiln.

SIZES.—These kilns can be built either **round** or **square,** and of **any** desired **size.** A number of these kilns are now in use that burn from **150** to **250** thousand bricks at a time. The walls are built **twenty-four inches thick.** They should be lined throughout with fire-brick where the clay is very hard to burn. Good kilns can be made, however, without using fire-brick for any part except the **furnaces** and **bags.** In asking for cost of construction **state size of kiln in feet wanted,** whether the kiln walls, crown or bottom are any or all to be lined with fire-brick.

DRAWINGS and specifications for building kilns will be furnished any who purchase *kiln or yard rights.* We usually can furnish a man to superintend the building if desired.

For further information address

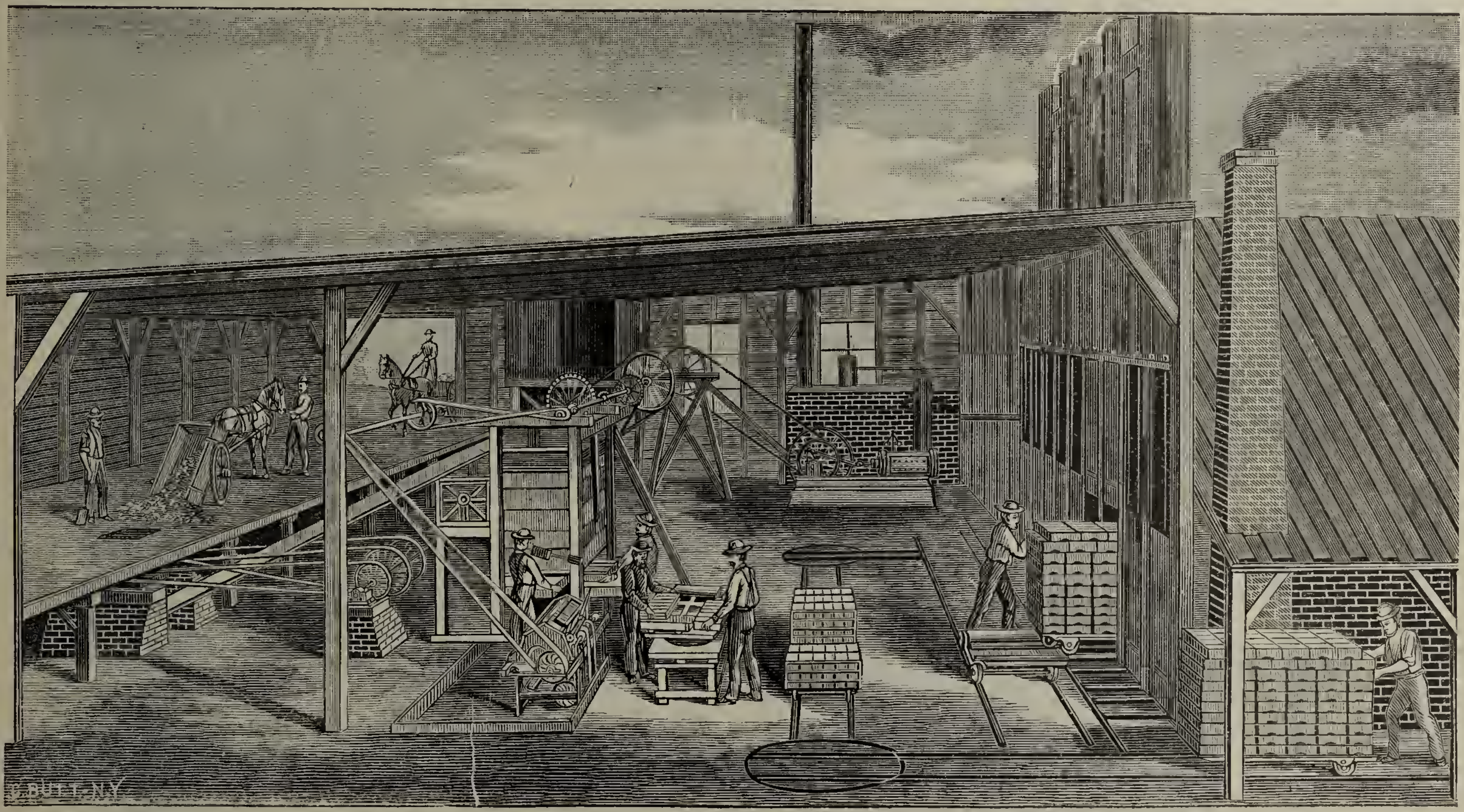
W. A. EUDALY,

64 Johnston's Building, - - - - CINCINNATI, OHIO.

SHARER'S IMPROVED DRYER

☞ More than one hundred now in use **DRYING SUCCESSFULLY** Soft Mud Brick, Stiff Mud Brick, Pressed Brick, Fire Brick, Hollow Brick, Tile, Plaster, Architectural Terra Cotta, Terra Cotta Lumber, Peat and Lumber. ☜

No other Dryer in existence can successfully dry such a variety of Materials.



23 are now in process of Construction and under contract to be built this Spring.

The Only Successful Soft Mud Brick Dryer in Existence.

Will also dry Stiff Mud, Semi Dry and Pressed Bricks at 50 per cent. less cost than any Steam Drier.

No other Dryer will Guarantee to dry Soft Mud Brick. I Guarantee to dry any kind of Bricks.

It is not a Direct Heat Dryer, nor a Steam Heat Dryer. It is a Radiated Heat Dryer. The heat being produced from Coal, Wood, Coke, Oil, Gas or any kind of Fuel, and Radiated through Brick or Metal floor. The heat can be so graduated as to successfully dry the most Tender or Refractory Clays without damage. While in a Direct Heat Drier the product of combustion coming directly in contact with the material to be dried will warp, check and crack in most cases. In a Steam Drier the heat cannot be graduated. Neither can heat be produced from Steam near as cheaply as from the Fuel Direct. With a Steam Dryer it is necessary to run one or more Boilers and Exhaust Fans day and night. There is No Machinery whatever necessary to operate my Dryer. Hence the wear and tear and expense of operating is reduced to the minimum.

References and all information given by letter or otherwise. Address,

GEORGE W. SHARER, Proprietor,

ED. H. CALLAWAY, Gen'l Agt., 72 Redde St., New York.
E. A. KING, Special Agt. New England States, 48 Congress St., Boston, Mass.
HUGH CAMERON, Toronto, Ont., Special Agt. Dominion of Canada.

TERRE HAUTE, INDIANA.

Improved Eureka Dry Press Brick Machine.

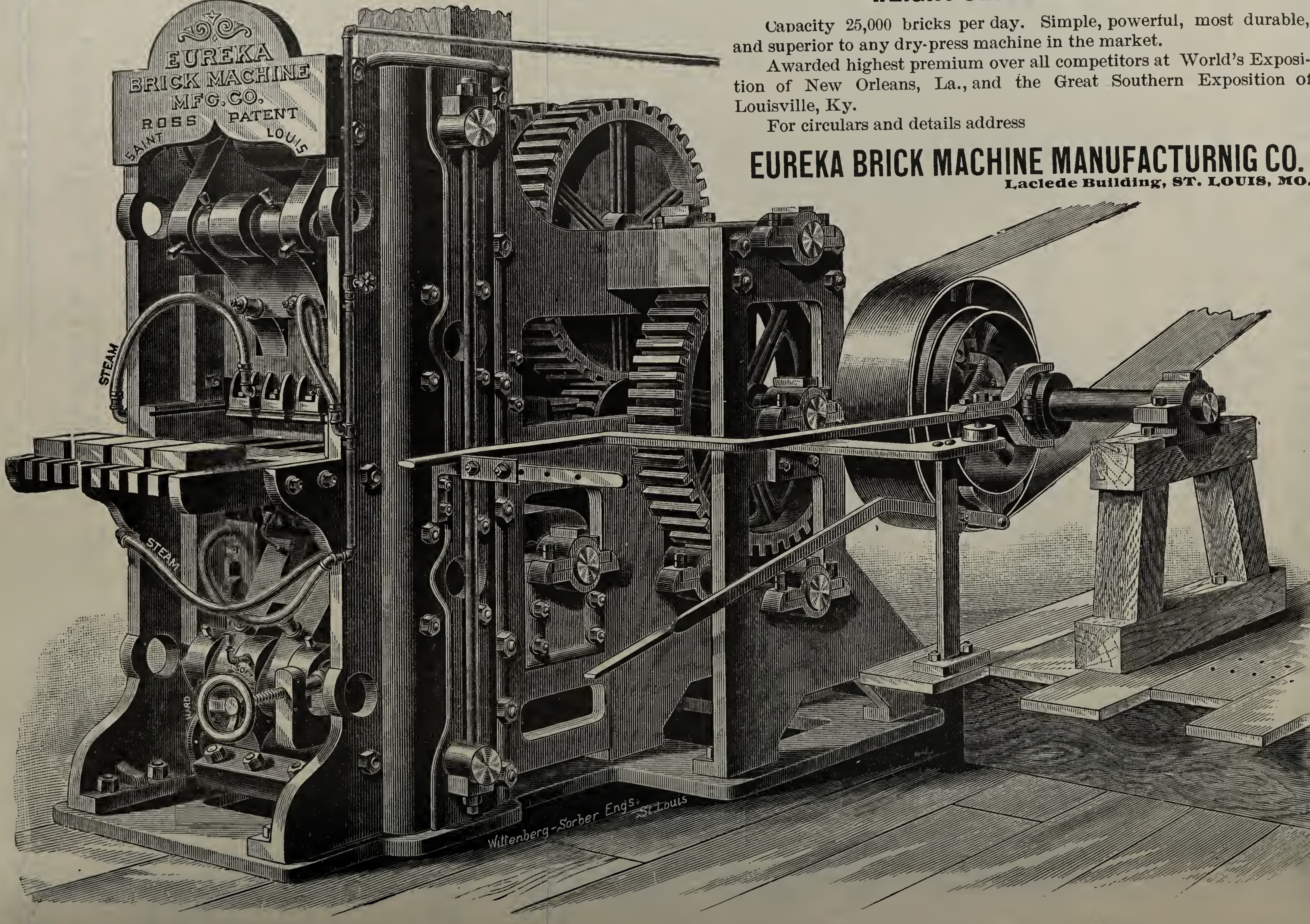
WEIGHT SEVENTEEN TONS.

Capacity 25,000 bricks per day. Simple, powerful, most durable, and superior to any dry-press machine in the market.

Awarded highest premium over all competitors at World's Exposition of New Orleans, La., and the Great Southern Exposition of Louisville, Ky.

For circulars and details address

EUREKA BRICK MACHINE MANUFACTURNIG CO.
Laclede Building, ST. LOUIS, MO.

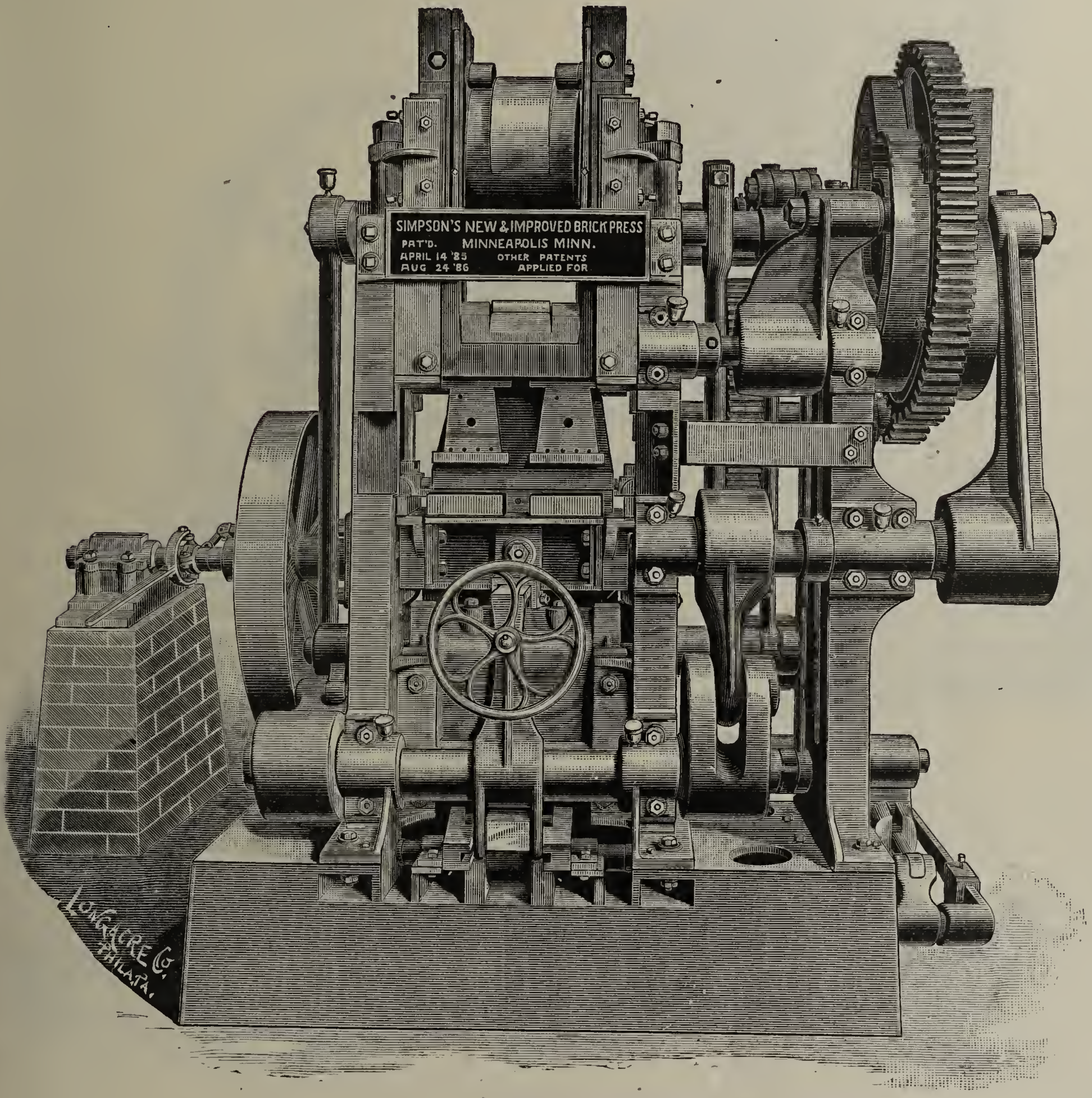


EASTERN AGENCY, 1321 F STREET, N. W., WASHINGTON, D. C., FRANK P. STONE, AGENT.

SIMPSON'S NEW

AND

IMPROVED BRICK PRESS.


SIMPSON'S NEW & IMPROVED BRICK PRESS
PAT'D. MINNEAPOLIS MINN.
APRIL 14 '85 OTHER PATENTS
AUG 24 '86 APPLIED FOR
LONGACRE CO.
PHILA. PA.

Send for particulars and prices

SIMPSON BRICK PRESS CO.,

44 Tribune Building, MINNEAPOLIS, MINN.

t. Louis Iron and Machine Works, Iron Founders and Builders of Heavy Machinery.

ESTABLISHED 1854.
INCORPORATED 1875.

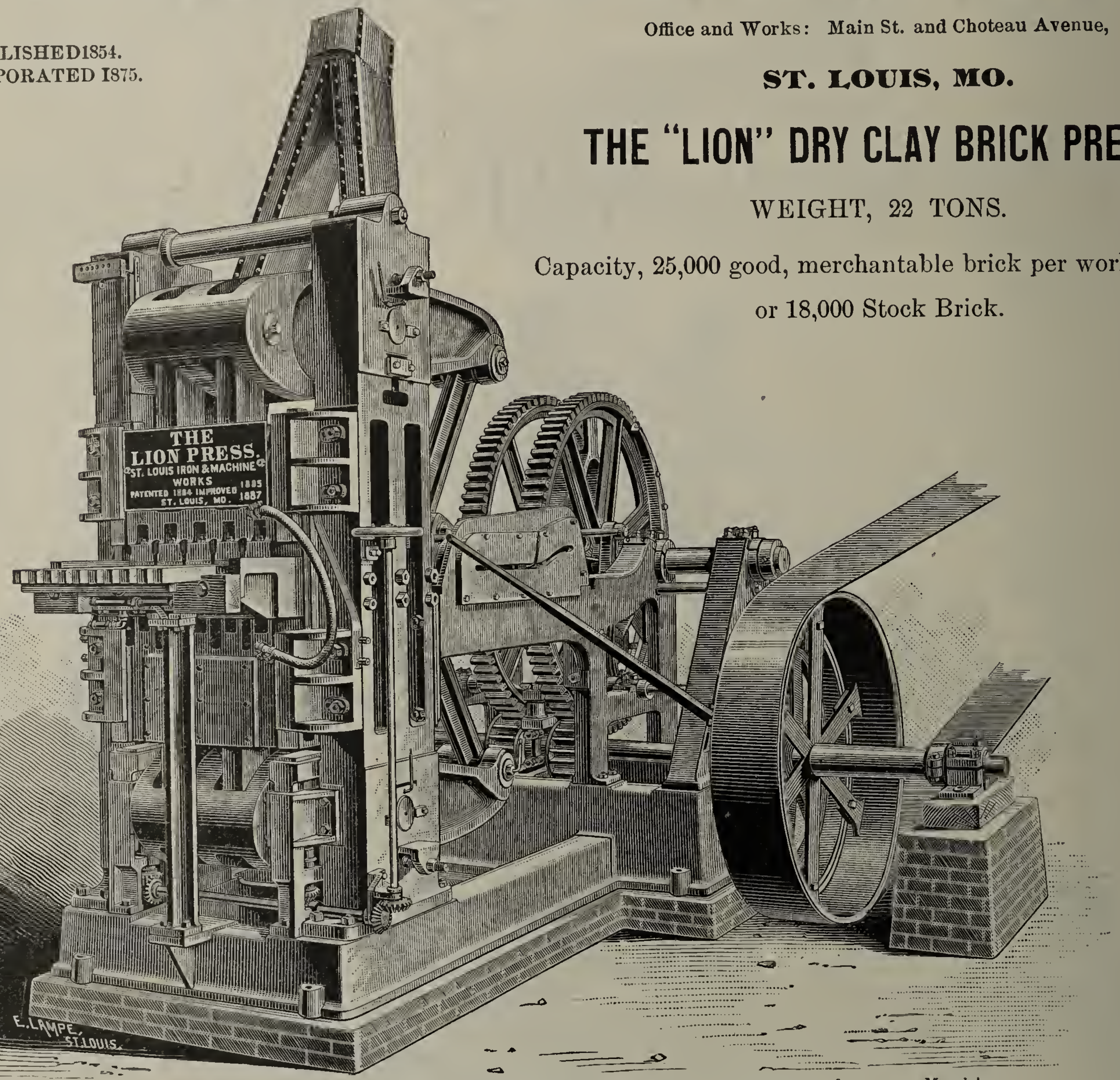
Office and Works: Main St. and Choteau Avenue,

ST. LOUIS, MO.

THE "LION" DRY CLAY BRICK PRESS.

WEIGHT, 22 TONS.

Capacity, 25,000 good, merchantable brick per working day, or 18,000 Stock Brick.


THE LION PRESS.
ST. LOUIS IRON & MACHINE WORKS
PATENTED 1884 IMPROVED 1885 1887
ST. LOUIS, MO.
E. LAMPE, ST. LOUIS.

We claim the following essential features and advantages for our Machine:

1. The main feature of this machine is its great strength, power and durability. The pressure on each brick being 40 tons, and the working parts are so strongly constructed that there is no spring or give under this working strain. 2. The great simplicity and openness of framing and construction, so that every part of the machine is to easily accessible for inspection, lubrication and adjustment, thereby reducing the necessary repairs, incidental of every Brick Press, to a minimum. 3. Pressing 5 bricks at each revolution of Machine, keeps the regular force of off-bearers and setters fully employed, which a 4 Brick Machine cannot do. 4. The adjustment of machine from common to stock brick and vice-versa, can be made in a few minutes' time.

Besides the Press, we manufacture and furnish a complete set of clay preparing Machinery, Elevators, Mixers, and Rollers; also Engines and Boilers complete. We also build different kinds of Steamboat Machinery and Stieam Boilers, Corliss Engines, Cotton Compresses, Water Work Plants, Coal and Mineral Mining Machinery, Bridge Work, Hoisting Travelers, Cranes and Elevaters; also general and large castings and Machinery. Any further information cheerfully given.

TESTIMONIALS.

St. Louis Iron and Machine Works, St. Louis, Mo. KANSAS CITY, MO., September 28, 1888.

GENTS: The two "Lion" Presses I bought from you about two years ago have given me entire satisfaction. As a dry clay press I think they have no superior. I prefer the "Lion" to the "Hydraulic". Ever wishing you success with the "Lion," I am,

Very Truly Yours, DRURY UNDERWOOD.

OFFICE OF
TENNESEE BRICK MANUFACTURING CO.,
NO. 7 MADISON STREET,

MEMPHIS, TENN., September 28, 1888.

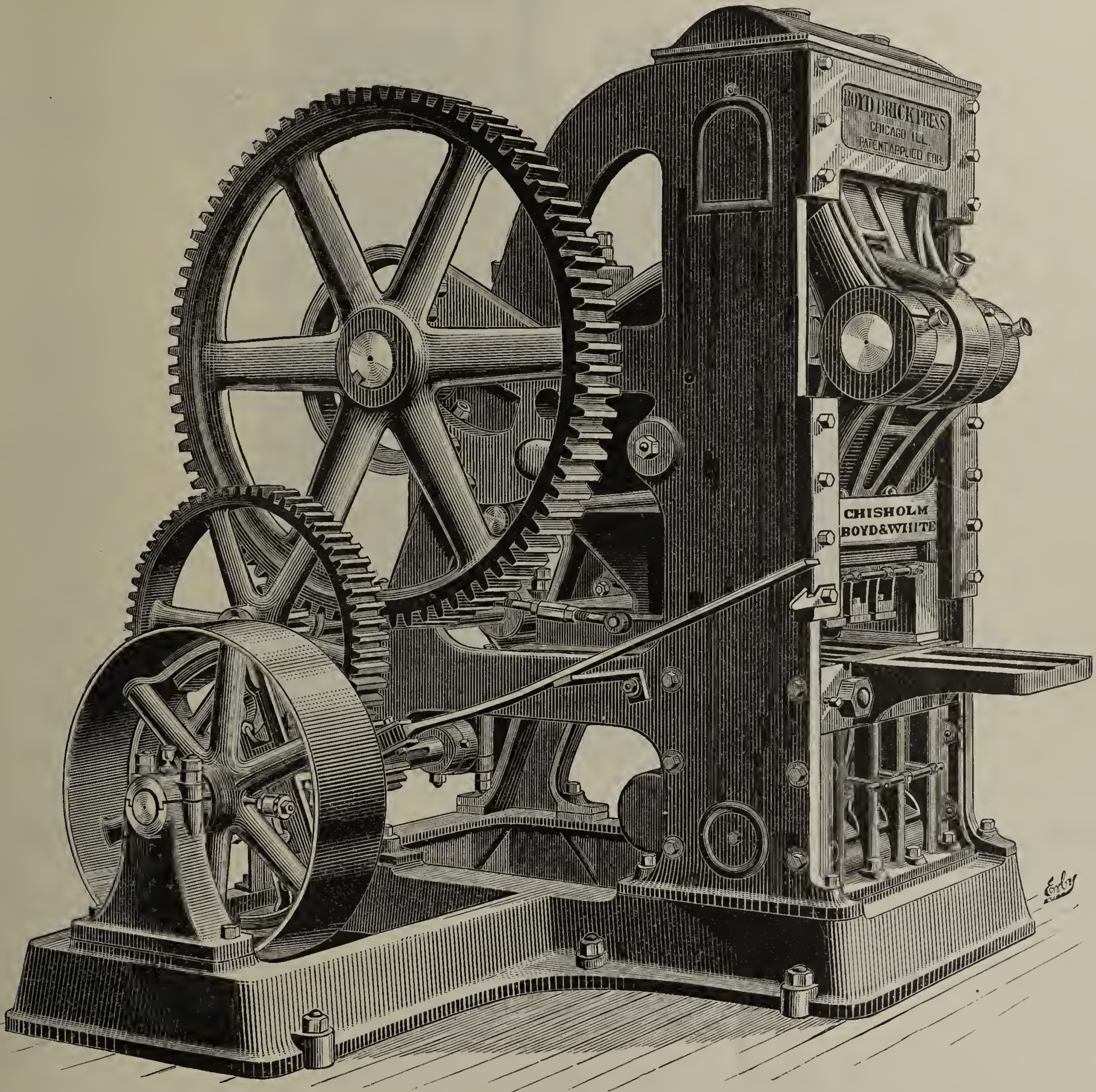
St. Louis Iron and Machine Works, St. Louis, Mo.

GENTLEMEN: In reply to yours of 25th inst., we beg to say that our Company contracted with you last spring for one of your "Lion" Brick Machines, having concluded, after our President and Superintendent had thoroughly investigated most of other machines, including the Hydraulic, that yours possessed more advantages and promised better results. In due course the machine was delivereed, set up and put into operation. After having operated it all summer to full capacity, we are more than pleased with results and can heartily recommend the Mahcine to any one contemplating a purchase. To fully appreciate the merits it must be seen performing work.

Wishing you that eminent success which you so well merit we remain Yours Truly, C W. EDMONDS, Sec. and Treas.

THE BOYD BRICK PRESS

Will make a greater quantity of Perfect Brick (of maximum weight) per mould for a consecutive number of days than any other Semi-Dry Brick Press in the world and Superior in Quality to Hydraulic Pressed Brick.



☛ Correspondence Solicited.

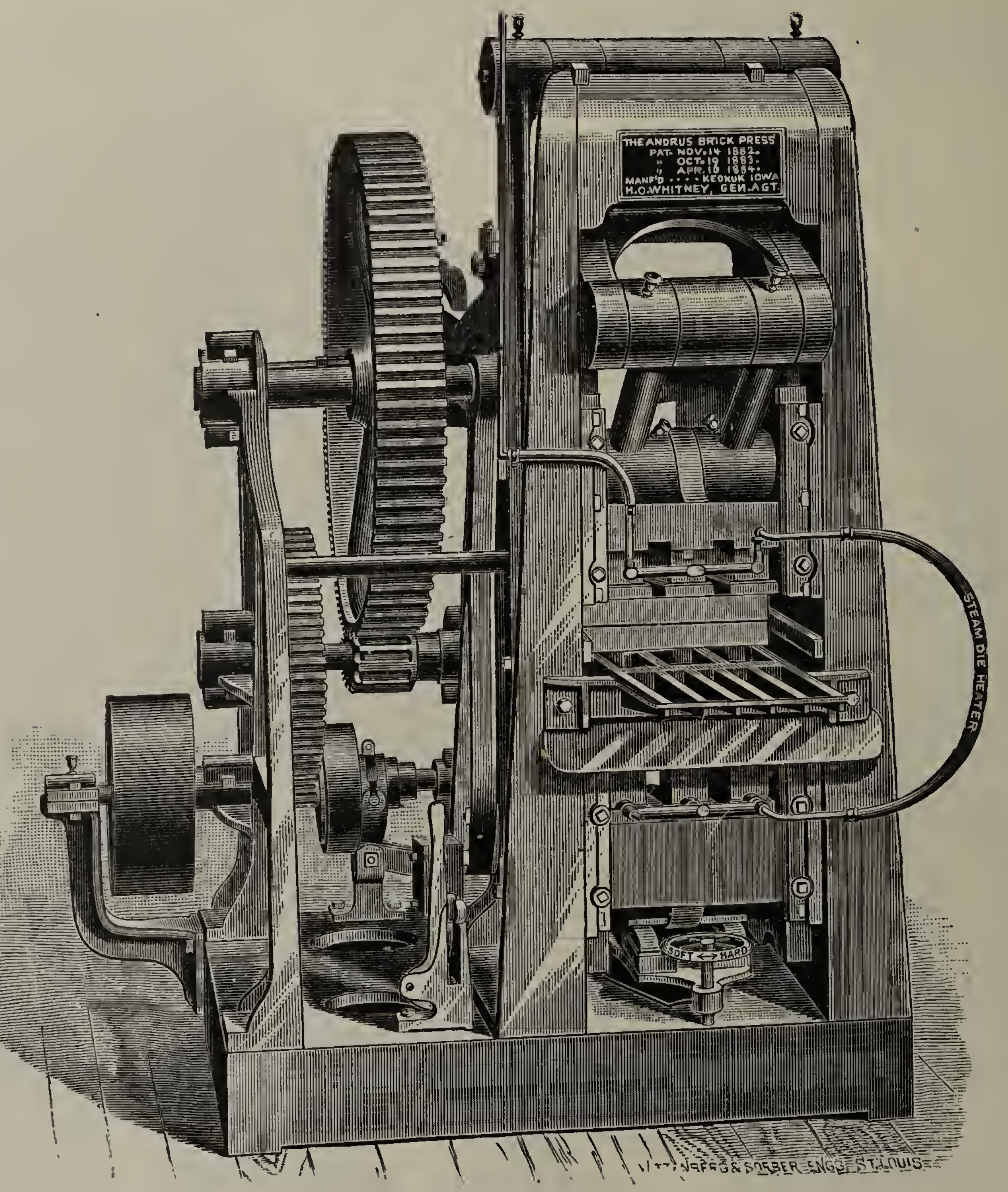
CHISHOLM, BOYD & WHITE,

86 Adams Express Building, CHICAGO, ILL.

THE

Improved Andrus Double Pressure Brick Press.

UNRVALLED FOR SMPLICITY, POWER AND DURABILITY.



The Pressed Brick made on the Andrus Machine have been tested by the U. S. Government and adopted for fronts in Government Buildings.

Built at our OWN FACTORY with heavy forged STEEL pressure arms and fully guaranteed against breakage. Not an experiment but a TRIED and PROVEN success.

60 machines in successful operation the past season. Examine it before purchasing.

Ittner Bros., St Louis, Mo., using the Andrus Presses produced 36 large kilns of brick of unsurpassed quality he past summer.

Samuel J. Rose & Son, Chester, Pa., and many others have made a splendid success.

The Andrus Press, Clay Crushers and Pulverizers can be seen in operation at all times at Our Factory.

Send for descriptive circular and reference, address

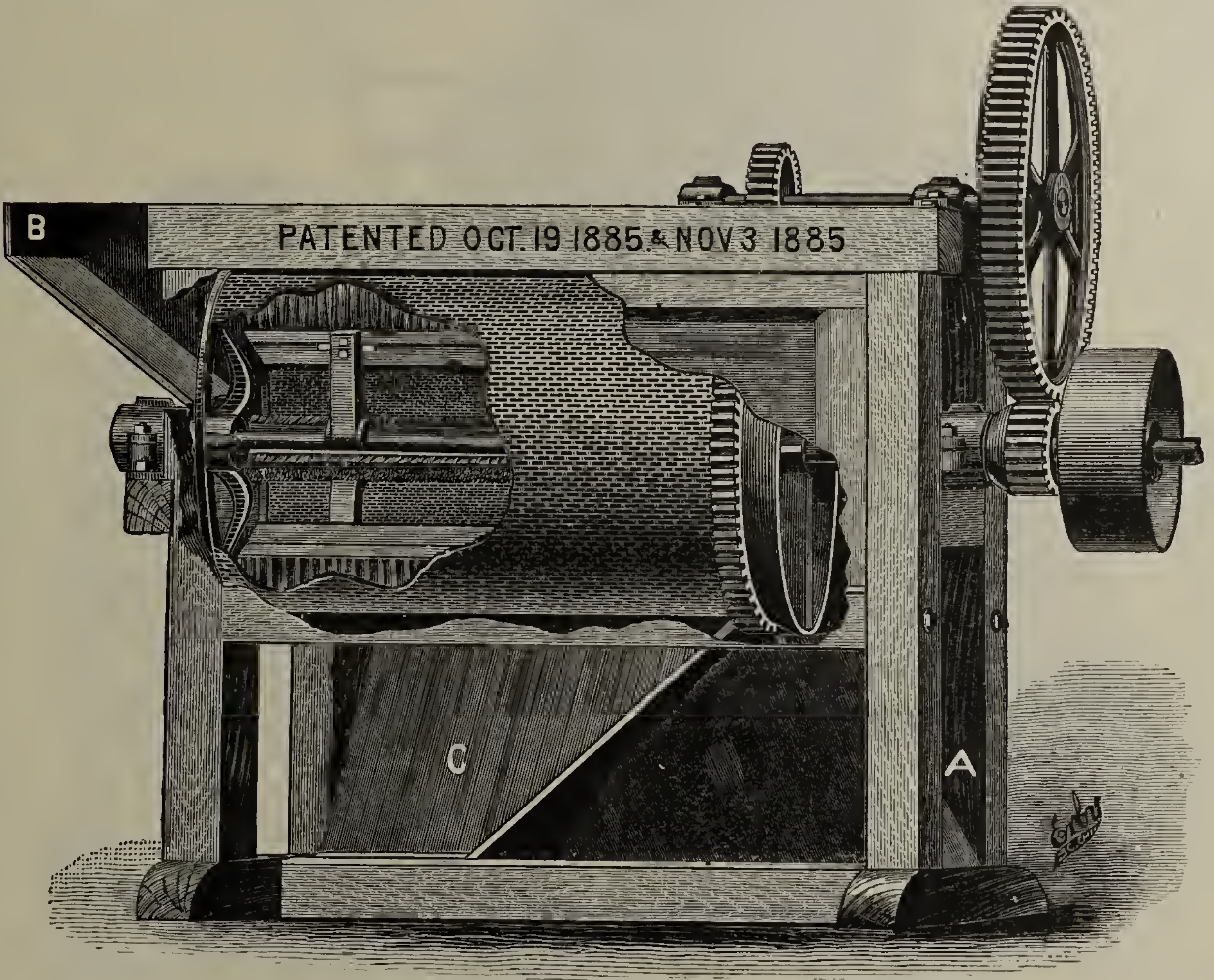
H. O. WHITNEY, Gen'l Agent,

General Office and Factory, KEOKUK, IA. (Mention the Clay-Worker.) KEOKUK, IOWA.

THE BOYD

Clay Pulverizer and Stone Separator.

ACKNOWLEDGED THE BEST.



B.
Dry or Semi-Dry
Clay goes in
here.

C.
Pure Clay comes
out here.

A.
All Stones, Pebbles & foreign
substances
come out here.

I OFFER to those engaged in Clay-working, a machine that has no equal for removing Stones, Roots, Pebbles, or other foreign substances, and reducing Clay to Granules, for Dry or Semi-Dry Press Brick making, Terra Cotta, Tile, or other articles manufactured from Clay, which require a *Strictly Pure Quality.*

It is especially valuable to makers of Fine Press Brick, Tile, or Terra Cotta, as the lime-stones and pebbles are removed entire—not crushed and left in the clay. This machine is not a crusher, and will not pulverize wet clay or mud. The clay to be pulverized in this machine must be in a dry or semi-dry state.

Its capacity is from 40 to 60 tons per day of ten hours, and requires only from 4 to 6 horse-power to drive.

ROBERT B. SMITH,

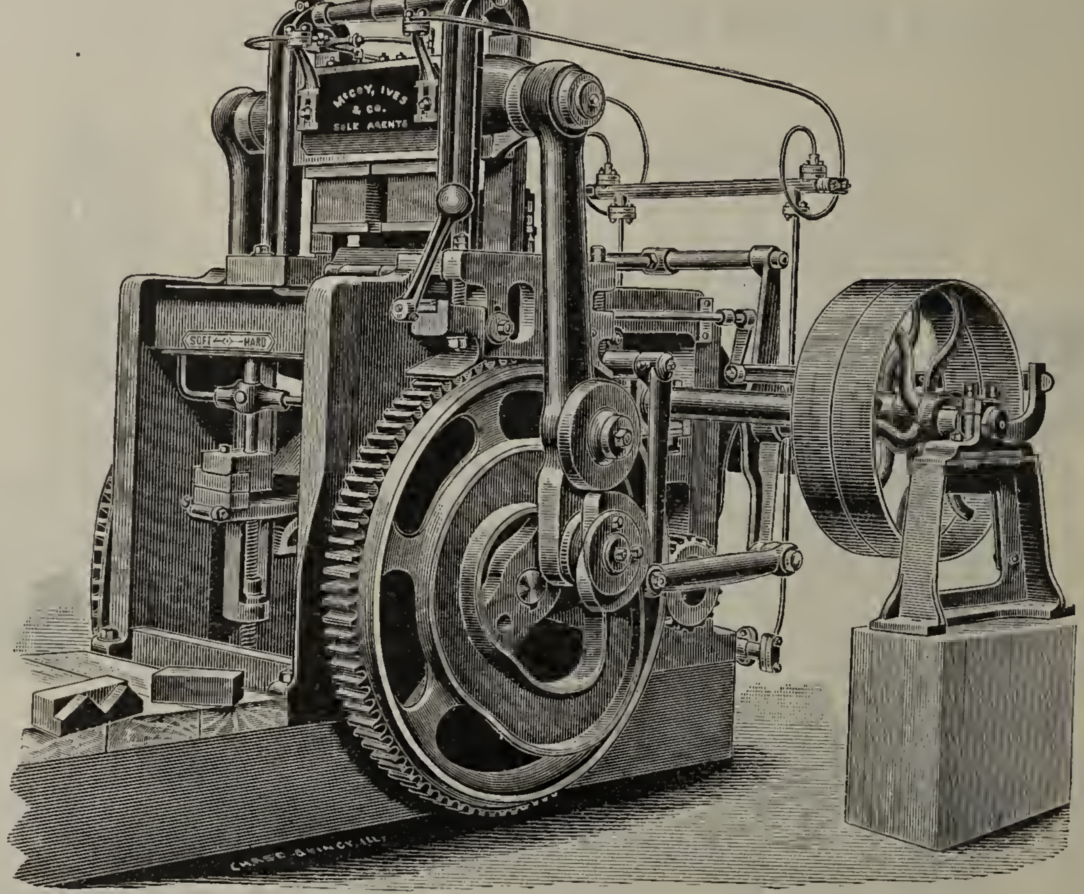
Licensed Manufacturer.

OFFICE, NOS. 116 and 118 DEARBORN STREET, ROOM 55.
CHICAGO, ILL.

Agency of the Carman Dry or Semi-Dry Press Brick Machine.

WHITTAKER'S CELEBRATED
SEMI-DRY BRICK MACHINE
[Patented in U. S. May 13, 1884.]

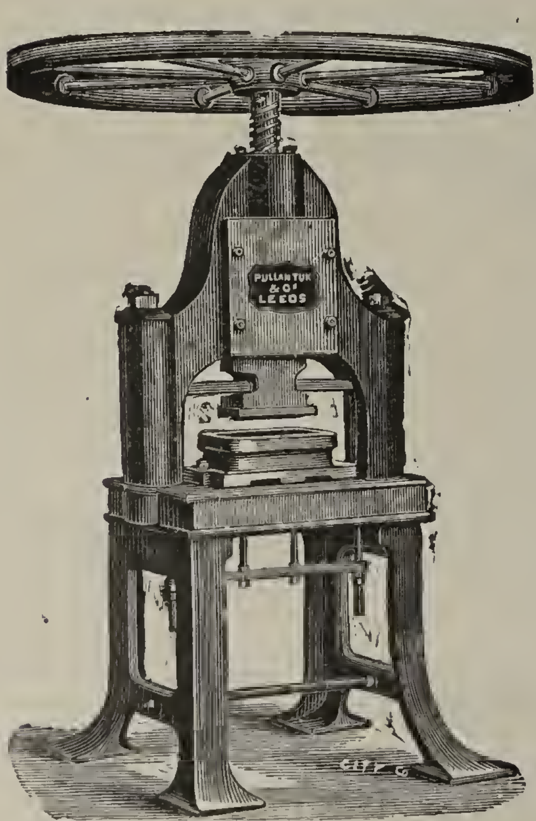
THE BEST ON EARTH.



THE BEST ON EARTH.

For Circulars and other information address **McCOY, IVES & CO., Quincy, Ills.**

Titley's Patent Screw Press.

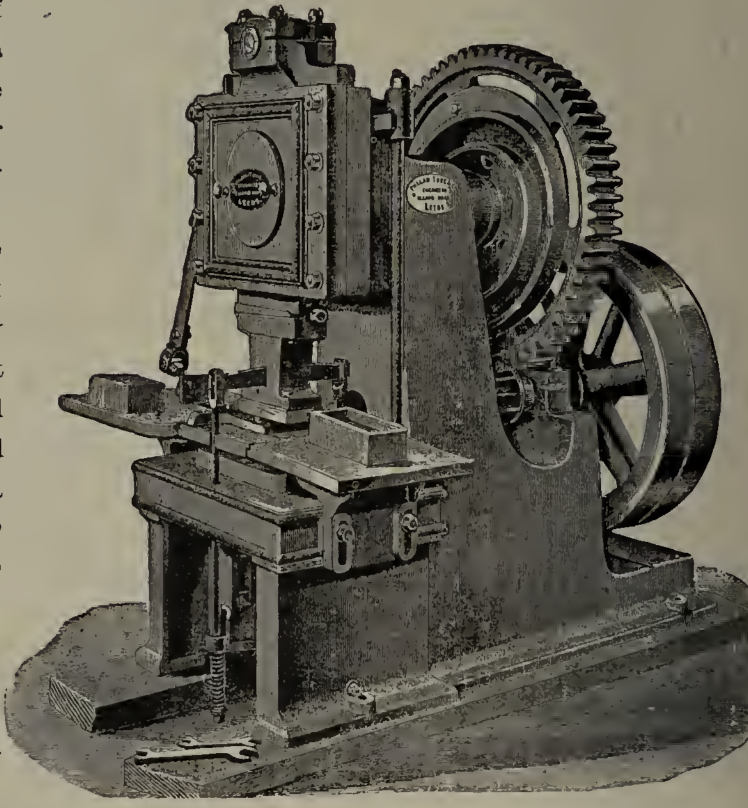


WE beg to call the attention of Brick, Tile and Terra Cotta Makers to these two Presses as the *Peers of any press on the market* for superiority of finish in the work produced.

The *Steam Press* is best adapted to large works and will produce the best quality of Front Bricks. Its capacity is 10,000 per day of the finest bricks at the smallest cost for labor. For small works and for all makers of moulded and ornamental bricks, tiles and terra cotta, we recommend the *Screw Press.* It will exert a pressure of 30 tons and is to-day *without a rival* a the *best press on the market.* Its capacity is 3,000 to 4,000 plain brick per day.

Send for circulars giving all information, with testimonials.

Pullan, Tuke & Gill's Patent Steam Press



ALFRED CROSSLEY,

Sole Agent for the United States. **Ironton, Ohio**

(Mention the Clay-Worker.)

The Brewis Patented Brick Press.

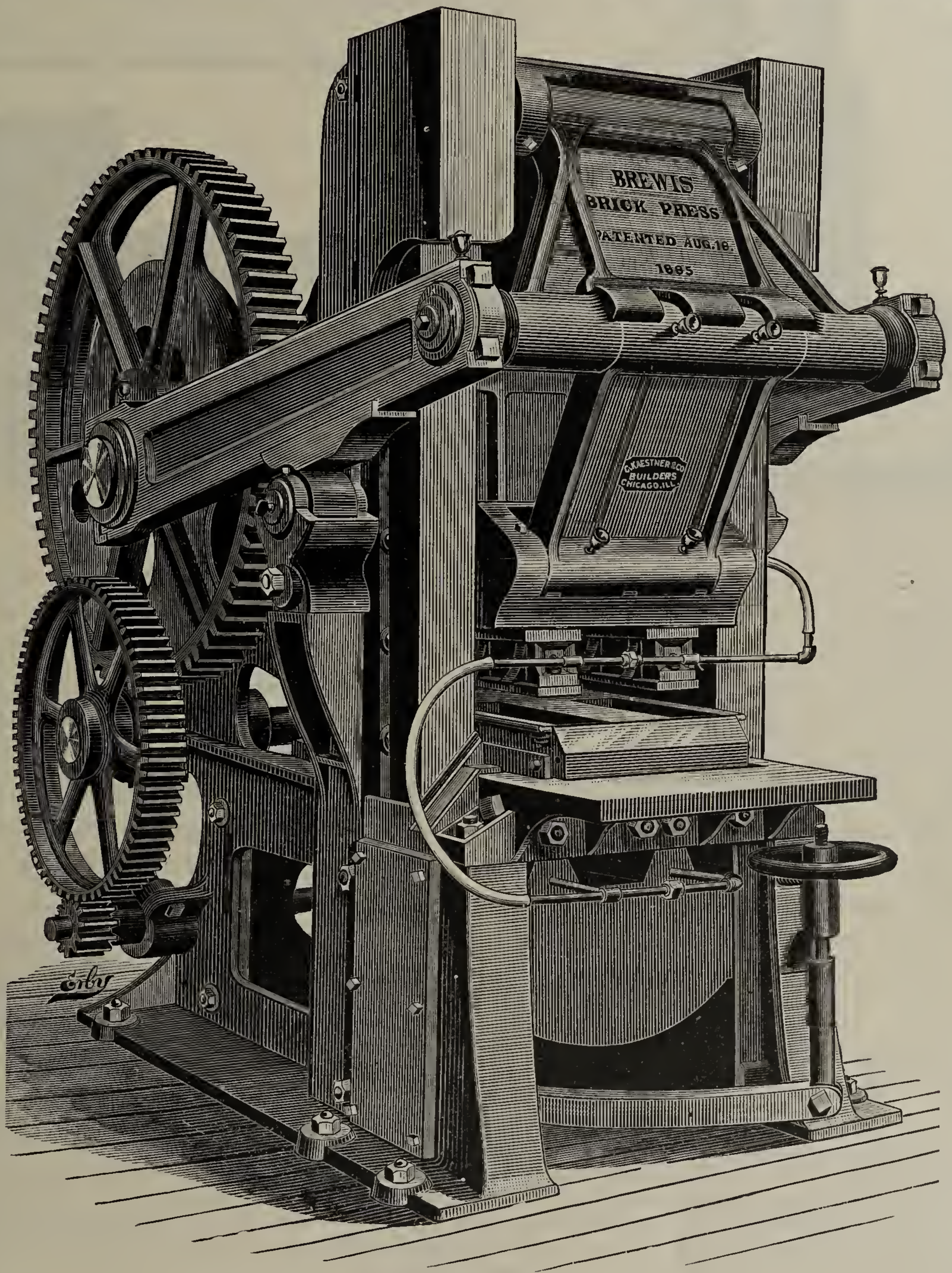
SIMPLE AND DURABLE.

Guaranteed to make as many Perfect Brick per mould as can be made on any machine now in the market. We except none.

Fully covered by patents. **We protect our purchasers.**

Capacity 8,000 to 16,000 a day depending upon the clay

Shipped to responsible parties on 30 to 60 days trial.



Guaranteed against breakage for Two Years.

We furnish the Boyd and Raymond Pulverizers at prices that defy competition. Send for Circulars and Prices to

CHARLES KAESTNER & CO., Machinists and Founders,

ENGINES, BOILERS, PUMPS, SHAFTING, PULLEYS, HANGERS, ETC.,

[Mention the Clay-Worker.] 303-311 South Canal Street, CHICAGO, ILL.

I. & M. WOLFF & COLEMAN

THE "IRON CLAD"

STEAM DRIER.

Automatic,

Simple,

Efficient.

Features Radically Different from any other Drier.

Is Broadly Secured by Bona Fide Patents.

Buildings Not Expensive to Construct.

Patentees and Sole Builders

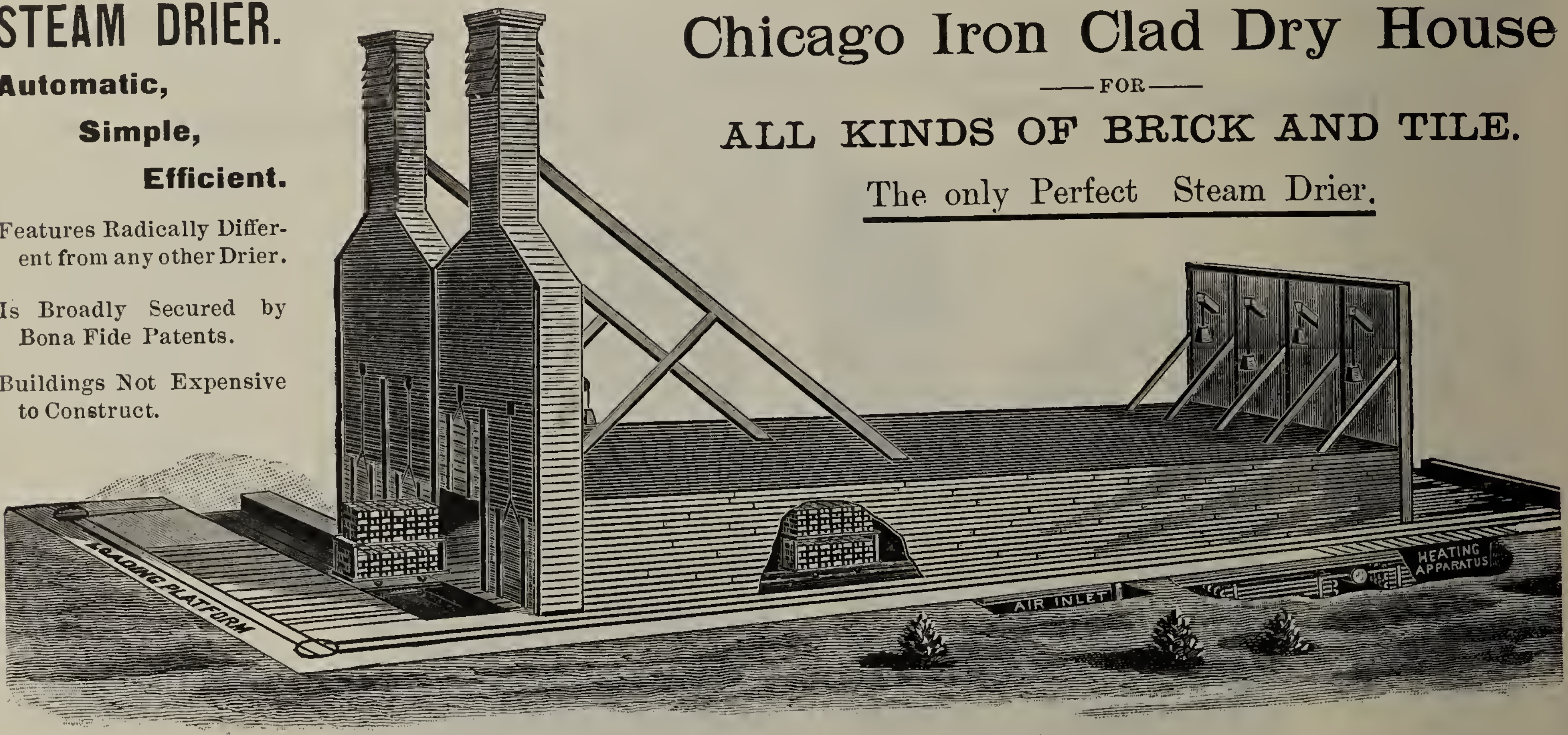
—OF THE—

Chicago Iron Clad Dry House

—FOR—

ALL KINDS OF BRICK AND TILE.

The only Perfect Steam Drier.



This Dry House is a combination of the Drying Floor and Tunnel System. The radiation from the Iron Floor extending over the heating coils dries the lower tiers of bricks. The perforation of the Iron Floor gives an even distribution of the heat and prevents cracking. The steam heat is not so intense as to melt down the bricks or bake them. The bricks are dried uniformly; they come out smoothly and burn evenly, with a good ring. The water-smoke is drawn off rapidly as made and the drying is even and gradual. Stiff mud bricks are baked on double deck cars and thoroughly dried in 24 hours. Soft mud bricks are dumped on pallets and cars carry the same through Dryer in 24 hours. Semi-dry and dry pressed bricks are specially provided for and can be dried without injury. We can convert other Dryers into our system, thereby improving product and capacity. Our buildings are constructed enentirely of wood; are simple, cheap and easily erected. We furnish complete steam heating apparatus with pipes and connections, Iron Cars, Turn-tables, Transfer Cars, Rail and superintendence. Confer with us before contracting elsewhere. We will save you money time and trouble. State character of bricks made, name of machine used and capacity required.

CORNING, N. Y., February 11, 1889.

Messrs. I. & M. Wolff and Coleman,
102 *W. Washington Street, Chicago, Ills.:*

GENTLEMEN—Your Mr. W. C. Byrne arrived here one week ago to see how the Dryer which you people put in for us was doing its work. A part of the time that he has been here the mercury has been 10 degrees below zero and the brick has dried as well as in midsummer. The Dryer, size 28x76, is doing all that you claim for it and we are sure if your directions are properly carried out it will dry more than 20,000 brick per 24 hours. Before we purchased this Dryer from you we visited several places where the hot air Dryers are in use and had partially decided to put in one of them; but seeing your Chicago Iron Clad Steam Dryer, advertised in the CLAY-WORKER, we commenced to investigate the merits of your Dryer. Of course we were told that steam was a failure; but we saw it different and we must say that this Dryer has been put in by you people to our entire satisfaction.

Yours respectfully,
CORNING BRICK WORKS, by C. M. RUBRIGHT, Sec'y & Treas.

I. & M. WOLFF & COLEMAN,

PATENTEES AND SOLE BUILDERS,

Write for catalogue.

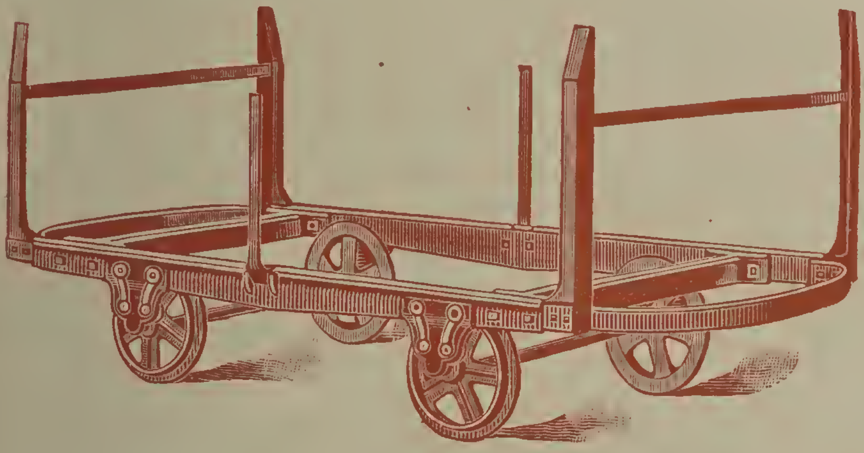
No. 261 Dearborn St., Chicago, Ills.

The Iron Clad Steam Dryer.

It will pay you to have your bricks thoroughly and equally dried before setting in kiln. You can dry them more economically in our Steam Dryer than in the kiln, besides getting a more uniform burn and better bricks. Handling and wheeling bricks costs money, and the bricks are often marred and in bad shape when they go to the kiln.

These trucks are strong and well made throughout, and the axles run in anti-friction rollers and are easily handled by one man:

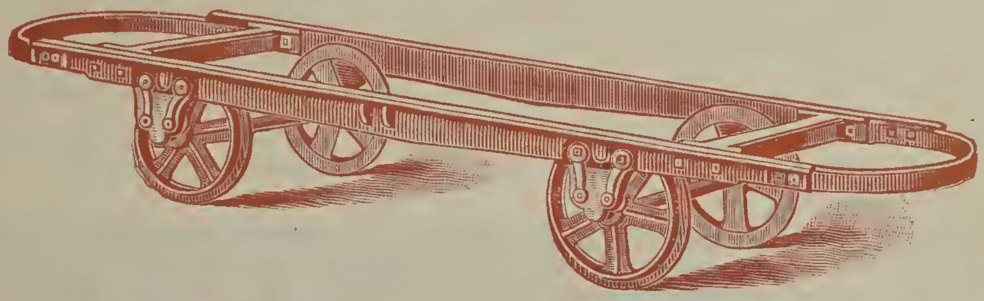
Cut No. 1 shows our double decked car, which we use for all the varieties of brick, sufficiently stiff to be haked; on the lower deck of which we hake four tiers high, and on the top deck five. This car is suitable for all of the stiff mud brick made by the various Die machines. It is also adapted for the drying of dry pressed and semi-dry pressed bricks.



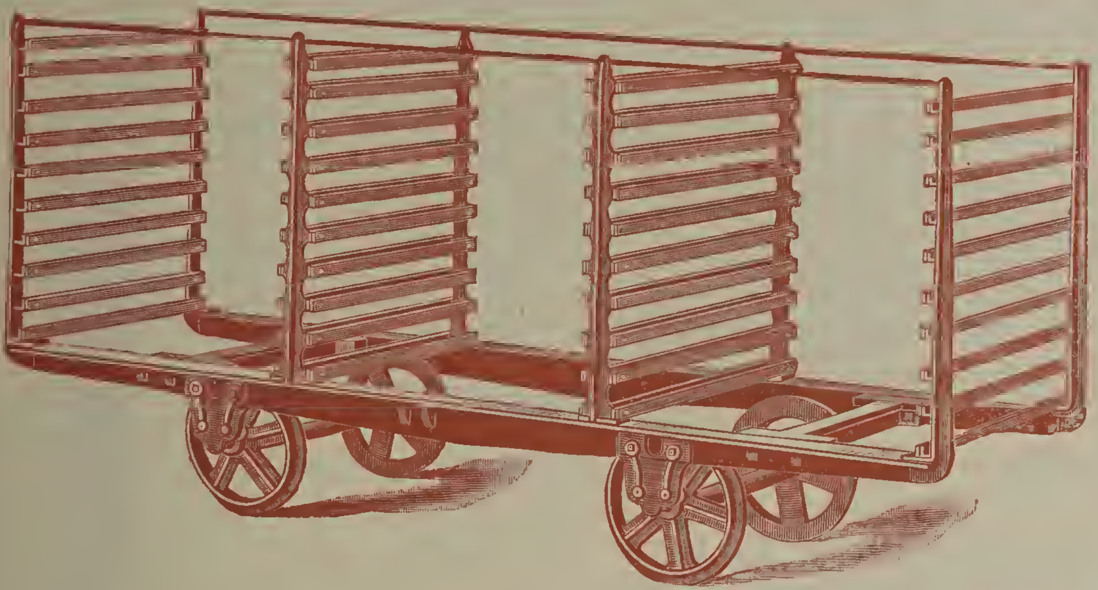
No. 1.

Cut No. 2 is a simple frame car which is used for foot pallets, or this car can be converted into car No. 1 or 3.

Cut No. 3 is for bricks that are too soft to hake and when pallets are necessary.

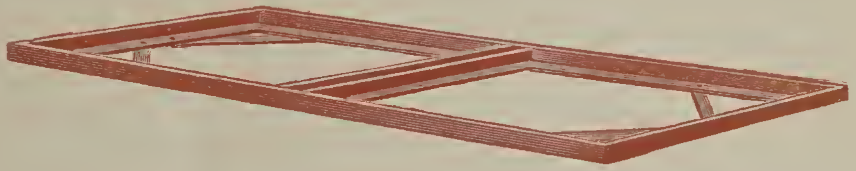


No. 2.



No. 3.

These racks, together with the car, are constructed entirely of Iron. They will be found strong, light and durable, and afford the best method of using pallets. They do away with the use of the foot pieces on the pallets, which are so much annoyance in handling. The pallets are made to slide upon the wrought iron bars which act as braces for the posts. We make these racks for the pallets to slide in lengthways of the car, so as to bring the side of the bricks towards the heat and also afford conveniences of putting in and taking out the pallets. You can reach across the car easier than lengthways of it. These cars are 8 feet 6 inches in length, and 34 inches wide.



No. 4.

Cut No. 4 is a substantial as well as a light frame—made entirely of wrought angle iron, and strongly braced, which is to be used for a top deck in the car, in cut No. 1.

ADDRESS,

I. & M. WOLFF & COLEMAN,

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I. & M. WOLFF & COLEMAN,

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THE CLAY-WORKER

VOL. XI. INDIANAPOLIS, IND., APRIL, 1889. No. 4.

Written for the Clay-Worker.

POTTERY.

No. 3.

It has often been urged in argument against our clay workers that they are deficient in art instinct and in capacity to produce ceramic work of superior excellence. It is true our work falls short of the *chef de euvres* of European and Japanese ware, but the falt is not due to our workmen, many of whom, and the most, are men who learned their art in England, France or Germany. Two things are necessary for success in any line—materials and a market. The general rawness and lack of development in the natural resources of the country compel our workmen to labor under supreme difficulties in producing superior wares. But the greatest want lacking is a public dispotion to patronize a superior home production even when, after extreme labor and expense, a superior product has been achieved.

True, the American Public is begining to be discriminating. A culture is being engendered that demands feeding. But the culture has not yet gone so far that it has developed into a love of art for itself. As yet, it is but a love of luxury that reaches every market, that patronizes every art but that which would thrive on it's own soil. It will pay a fabulous price for a "peach blow" vase if made in Japan and bite at an American imitation which it is unable to detect if presented under a foreign name while it refuses true merit if placed honestly upon it's face. Is is a part of that genius for tuft hunting which is due to the *neuvaux richesse* element of our new population.

Our people, as a whole, are lacking in the conservative element among the wealthy that has by liberal patronage raised the wages of Germany, France and England to their perfection and whatever our people may do is rated second-class by buyers whose judgment is so weak that they must depend upon the "brands" of severes or potsdam for a grade of wares that without these brands would be viewed with supercillious askance; in fact, be neglected.

Perhaps it is of little use to question the sentiment. The culture and innate judgment must come before it can appreciate and patronize merit wherever it may be found. The men of America who will pay for a meritorius art production no matter under what difficulties it were produced are few, so few, indeed, that the American has no incentive for effort and must betake himself, perforce, for purposes of bread earning to the production of cheap wares for the middle and poorer classes. In so far as his environment has permitted, or his market justified, the American clay-worker has proven himself in every way the equal of American genius in any other pursuit.

Although the capacity of his clays are only in part developed, his goods wear well and more than that, have an artistic elegance of form that recommend and gain ready sale. He has produced work of the highest finish but was obliged to see it passed by almost in disdain in favor of really inferior work that had nothing to recommend it but the prestige of the name of the foreign maker.

These are disagreeable facts but they will disappear with time. In fact, signs are multiplying that they are even now beginning to disappear, as here and there appears a spark of native judgment capable of knowing a good thing wherever or by whoever made.

The gist of the above remarks is apparent in the building trades which have appreciated to the fullest, the efforts of the terra cotta manufacturers to extend the list of artistic building materials. The result has shown that wherever effort was appreciated and patronized, it rapidly placed itself in the front, either in design, or execution, or excellence of quality. The present taste for striking effects in the details of domestic architecture, which, by the way, is not so new but that we may predict it has come to stay, has caused a pleasing ambition for excellence among manufacturers until American designs in these materials now lead the world. Only strong designs composed of few, strong, expressive and deeply cut lines should be used for exterior decoration in terra cotta, because fine detail in ornamentation will not only be lost on account of the distance from which the piece must be viewed, but will lower the effect of the entire design. For interiors, however, the happiest effects of relief may be chosen, because here the piece is sufficiently near to the eye to enable the viewer to appreciate delicate or intricate detail. The masters of constructive art have never lost sight of these radical differences. Thus Phidias, the master of Greek art, constructed the pictorial rieze of the Parthenon and the statue of Minerva that was enshrined in it. The former (now in the British Museum) seems on first view to be rough as if chopped out with an axe. But it did not so appear when in its place, 80 feet from the beholder. The very roughness added to its strength. But within, all the happiest art of this great artist was expended in the truest delicacies of expression, drapery and finish on the ivory Minerva.

The accompanying cut is a handsome model for an interior decoration. So, indeed, it would be for an exterior, but for the latter the design would need radical overhauling; much of the detail would be omitted, the forms brought much further out and the finish left undone or purposely overdone.

Geometrical models are, to our thinking, too much adhered to by our designers. They are, as a rule, unfit for panels. Floral panels that are just now the rage are, by themselves, inexpressive, and should be used only as adjuncts to a bolder design. Some life is necessary in all panel designs, whether it be a bull's head for the pediment of a brick stable, or an Apollo for a center piece of a mantel and this is happily illustrated in the cut—a design by one of the best artists of Florence, Italy, and a model that would grace any interior piece into which it could be placed.

Written for the Clay-Worker.

STRENGTH OF BRICK WORK AND OTHER QUALITIES.

BY PROF. R. C. CARPENTER.

The principal value of any material for building depends on two qualities, durability and strength. But other qualities subordinate in nature to those mentioned, often are of equal weight with builders; among these may be mentioned uniformity in texture and color, size and cheapness.

So far as the two principal qualities, durability and strength, are concerned, no material surpasses or even equals brick, but as regards the subordinate condition of uniformity, except as to size, many materials surpass brick. The only objection that can be charged against brick arises from the fact, of this lack of uniformity. You will find on the brick yard, and often from the same kiln, all qualities from a dry lump of clay to hard burned and perfect brick. I have often wondered at just what point we could define the transformation from clay to brick. When a manufacturer I was willing to accept a liberal interpretation and never objected to supplying all the soft brick the market demanded. When acting as an inspector of building materials I have insisted on the use of hard brick unless the specifications permitted the use of other brick for inside walls. It is, I think, the common practice, certainly in most small cities, to use a great many soft brick in the inside walls; and I shall not condemn this practice because such brick, although not possessing great strength, are, as I will show later, amply strong for the load they are likely to have imposed upon them.

I have incidentally remarked that brick are durable, I mean by that not all brick but some brick. I think no material known will stand the effect of weather and time as well as brick, *i.e.*, some brick. You are all perhaps familiar with the effect of our climate on the granite obelisk, now standing in Central Park, New York, and that is probably effected no more than our best American granite. I venture to say that the hieroglyphics of that monument, change more in one year than lines or mouldings equally delicate would change in ten years on our best brick work in the same place.

So much for the durability of our best brick. What can we say of our poorest brick, it will hardly do to expose them over winter; the effect of moisture and frost will completely disintegrate them. Instead of being able to carry a load, if exposed to the weather, they will soon not support themselves. This great difference in the quality of brick, is really a serious objection to the use of brick, and makes it continually necessary to inspect brick and use every test in our power to separate the poor from the good. Now as to the strength of brick, there is fully as much difference in the strength as in the quality to withstand the weather, but I have always maintained that the strength is of little importance to the builder or brickmaker, for the reason that the poorest brick possesses a strength, much in excess of any load likely to be placed upon it, unless it is an index to the more important quality of durability.

What little I have done in the way of testing brick was with the idea of finding how the effect of certain methods of manufacture, using the same kind of clay, influenced the result, rather than to determine the strength of brick in general. For this case, the reader cannot do better than to consult the able work of Prof. I. O. Baker, published by J. Wiley & Son, New York.

I have also taken particular pains to test the poorest brick that would be admitted to a building, selecting such brick myself in order to see what the actual standard of use was. I am free to confess that I have not completed this series of tests, and consequently I am not ready to report in detail. My results naturally are low, but seem so far to agree well, with the tests made by Collingwood of the common brick of New York.

I think I can state the only point of interest in this connection, that I have so far noticed in these tests, and that is that the strength of the poorest brick tested, crushed when placed sideways between thin pine boards, at about 600 lbs. per square inch. These brick were soft and pale, and as poor as would be admitted in any building. Rankine in his Civil Engineering places the softest brick as low as 300 pounds per square inch, but I have found no brick as weak as that.

BRICKWORK.

The mortar, which must invariably be used with brick, varies in its strength and durability more than the brick itself. There is no doubt but that the best brick in the world laid with worthless mortar, would result in worthless brick work, so that to secure good brick work, the people are as much dependent on the builder as on the brickmaker. The best mortar, unless quite old, very seldom exceeds in strength the poorest bricks that would be admitted to a building. Yet, nevertheless, strong brick with weak mortar will make a stronger column, to sustain a crushing force than brick of the same strength as the mortar.

With selected bricks and excellent mortar, some very high results have been obtained, on the short columns that come within the capacity of the testing machine.

There is certainly no difficulty in securing a mortar that will stand a crushing force of 300 pounds per square inch, some in a few days after laying, so that the brick work ought certainly to exceed in strength, that of the brick mentioned by Professor Rankine.

Now then let us examine for a moment the sustaining power of the weakest brick tested by Rankine; 300 pounds per square inch is equivalent to 43,200 pounds per square foot, or nearly 22 tons. This would sustain a column of its own material, weighing 125 pounds per cubic foot 345 feet high. Professor Rankine calculated that the greatest stress, coming on the brick work of a chimney at Glasgow, Scotland, 468 feet high, because of its expanded base did not even in a gale of wind exceed on the leeward side fifteen tons per square foot, a strain much less than the capacity of the poorest brick. I, myself, remember to have caused a number of worthy builders of our vicinity much anxiety, a number of years ago, because I placed a water tank, connected with our College water works, in the top of a tower 70 feet from the ground.

The walls of the tower for 30 feet below the tank were only twelve inches thick, and besides, were pierced in several places for doors and windows. The weight of the tank and contents at a maximum is about 60 tons. To carry this I inserted heavy beams of wrought iron, resting on plates of cast iron, inserted in the brick work. The tower was thoroughly tied together and supported from side vibration. The additional weight caused by this tank may have been at the tank eight tons per square foot, but was soon distributed throughout the whole mass of brick work and reduced to less than one ton per square foot.

To satisfy the fears of the anxious ones, I removed a half brick a few feet below the tank, and fitted a block of wood just so that it could be slipped in by hand when the tank was empty. I then filled the tank with water, and as I expected, there was no evidence whatever of settling which would have exhibited itself in tightening the block. I was thus able to satisfy all that the tower was safe.

It is my impression that if brick work has sufficient thickness and solidity to withstand the jars of moving loads and side strains tending to crowd it outward, there is little possibility of crushing it by any load that could be imposed in a building.

Another thing in favor of brick work; experiments show that it will commence to crack and splinter, with a load varying from one-third to two-thirds its breaking load, consequently it does not fail without warning and time sufficient at least, to save life could in all cases be had, if the warnings were headed. This is an accident, however, that so far as I know has never happened.

I see that a fourteen story building in Chicago failed a few weeks ago; the first reports claimed the falling was due to overloading the brick work, but later reports indicate a failure of interior metal work in the floor system and that the brick work remained intact. I have since learned that the walls were not injured and will not be taken down; so that the accident does not prove as an illustration of the effect of overloading brick.

This argument will no doubt raise the query in many minds as to the necessity of testing brick. My own idea is that the test of a brick may bring out other qualities more important than its power of resisting a crushing force. Thus, for instance, in a catalogue issued by Mr. Anthony Ittner, of St. Louis, Mo., I notice that his brick withstood a test of from 8,870 pounds per square inch to 12,780 pounds when tested in the ordinary flat position. Now, as this amount is about three times the strength of the best brick from this locality I believe that they also possess other superior qualities. The important point is rather the relation of strength to durability and other qualities, than the strength as an abstract amount. Indeed, if the strength alone is considered, we need to test not our best bricks but our poorest ones. The few tests that I made last year of brick manufactured from the same clay but by different processes, showed a decided superiority in favor of well tempered brick over those poorly tempered. In this case it happened to be hand-made and machine-made brick. In this particular case the strongest bricks did not ring as well, nor were they so hard as the other class, yet their durability was known to be superior when exposed to the weather. The relation in this case which existed in the strengths of the two kinds of brick also existed in other qualities of the bricks. I confess that I have no opinion as to what the final outcome will be in this method of testing if it can ever be completed. I would like the co-operation of such manufacturers as are interested, if they could send me prepaid a set of brick from their manufactory, with a statement of the method of manufacture of each kind sent, I would be glad to test them and will send them the results free of cost. I am especially anxious in regard to paving brick, as I predict a great future for this class of brick if they can be made tough, hard, durable and uniform.

I repeat that I do not desire to test a brick merely to find its strength. I would like to know the method of manufacture, the quality of the clay, and durability of the brick, if known.

Lansing, Mich., March 7, 1889.

Written for the Clay-Worker.

BRICKMAKING AND BURNING.

No. 1.

BY JNO. W. CRARY.

It is needless for me to say that brickmaking is one of the oldest arts practiced by man, yet it has made less progress in its methods of operation than any other art. In this article I will notice the different kinds of clay that is, or may be, used in the manufacture of brick of all descriptions. (See Webster's definition of clay, which is right, except that he like all brickmakers, says that clay will shrink or "contract by heat," which is only true as a rule.) All clays partake of a metal called aluminum.

"Fire clay," such as is generally used to make infusible brick for furnaces, is composed of alumina and silex, with, more or less magnesia, and a trace of protoxide of iron, etc. In proportion as iron and alkaline salts are present in clay, in that proportion it is vitrious, or fusible; and in proportion to the absence of iron rust or sesqui or protoxide of iron and alkaline salts, it is infusible. All "fire clay" has more or less alumina, silex and magnesia. The most of our primitive clays in the South are infusible by ordinary heat of "the furnace." In some places I have found that a kiln set 45 to 48 bricks high, would swell up three inches when perfectly burned, instead of settling eight to ten inches, as in the case of fusible clays. The clay on my own yard here will perceptibly swell under intense heat; yet I can melt a brick made of it if I put two ounces of soda or potash with it before molding it.

The metalic oxides is what gives color to clay. Where iron rust, or oxides of iron predominates, we find that kind of clay that burns a bright cherry red. The alluvial clays of our rivers and creeks, and the anti-alluvial or delluvial clays of much of our "table land," are of this character. The "silt" or clay deposited on the banks of the Mississippi river is alluvial clay, and makes a dull red, friable brick, easily burned but fusible under a low heat. Most of the brick of commerce are made of the more primitive clays, or the anti-alluvial clays, such as are found on the plateau lands of our rivers. The red brick of Philadelphia, Baltimore, Cincinnati and St. Louis, for instance, are of this kind of clay. The largest, deepest, and most unbroken continuous bed of this kind of clay in the United States is to be found at Baton Rouge, La. It is over twenty miles wide, one hundred miles long, and generally twenty-two feet deep. I have found this from personal observation and have made some of the finest red front brick of it that I ever saw. In fact, this mammoth clay bed is nearly continuous on the east bank of the table lands of the Mississippi River from Bayou Sara, La., to Memphis, Tenn., about 400 miles long and an average of twenty miles wide.

FIRE CLAY.

Our fire clay beds are of two distinct kinds of deposit, one is in veins or strata, conterminous with our coal fields; the other are the large homogenous primitive clay beds of New Jersey. South Carolina, Georgia, Florida and Alabama. All of these clay beds are found near, or contiguous to the sea-coast. The largest, most extensive and best are found in the southwest part of Florida and southeast part of Alabama. The Perdido river is about the center, running north and south. The best developed beds of "fire clay" are found in Escambia county, Fla. In fact, the whole country is underlaid with one vast interminable bed of potters and fire clay in strata from six to forty feet deep, often cropping out on the surface. This clay is suitable for all kinds of pottery, for "fire brick," and for the very best kind of building brick, or blocks for street paving, and is cheap, accessible, and in every way advantageously situated for profitable manufacturing.

HOW TO TEST CLAY FOR MAKING BRICK.

I have known many who got the "brick fever," or "brick in the hat," to start, and with plenty of money, to get rich on a poor bed of clay. The first work I ever did was to "turn up brick" on my father's brick yard in Cincinnati, Ohio. I went to "off-bearing" as soon as I could carry three brick in a mold; then I was put at a "table" as soon as I was strong enough to mold, and I learned to mold in all ways and all sorts of brick. I then was put to "setting" and in due time to "burning." We burned the old-fashioned way—closing up one "head," or side, and firing from the other about three days, then opening the closed head and shutting up the open one, then sliding wood over with the old slavish "home pole" until the first head was "settled," then reversing fires and going for the "middles" and "last head." Now, if you were an old scar-worn, weather-beaten "mud lark," that knew how to roast a stolen chicken, you would know just what I am talking about, and seeing that I have been sixty-five years in brickyards you will say "he must be a brick," and not a "samon" brick, at that.

When I started out for myself, I thought I knew all about brickmaking, and I got along first rate while working along on the Mississippi river where the clay was of the same kind I had been used to; I thought a brickmaker was a brickmaker, the world over. It happened that I left the Mississippi river and went to Little Rock, Ark., in 1838. I had an engagement to make brick there and I selected a clay bed which in all appearances was just the kind I had been used to. I soon had a kiln on fire, and the fires worked first rate. I was very much pleased; but when I came to "settle the heads" just as I had always done, the irritation began. There never was a more sleepless, vigilant man at a brick kiln than myself. I had the fires blooming out all over the top; the arches were nearly to a white heat, and hotter than I ever had a kiln before. I saw no signs of a "settle." I began to get scared; the idea that I had come there as a "crack, tip-top" brickmaker and now could not "settle" a brick kiln, when the fires and wood was all first rate, was too crushing for good temper, so I got several cords of the best dry, fine-split hickory wood and burned it as fast as I could throw it in, and keep up a rapid combustion. The "arches" were so hot I could not see the "overhangings;" they were as white as a snow bank. White blazes shot up all over the kiln and the walls cracked so that the whole kiln looked at night like a mass of molten matter, not a particle of "settle" appeared, and I closed the kiln as the greatest phenomenon of my life. I knew the kiln was burned, but the quality of the brick was what concerned me. On the fifth day after closing I opened the kiln, and, to my most agreeable surprise, the perfect uniformity, ring, strength and color of the entire kiln, excepting the outside course of brick, was the most perfect I had ever seen. Then it was that I saw the wisdom of Dr. Franklin's aphorism, "That sensible people never finish their education." I saw that stereotyped practice in brickmaking would only do in the clay bed where the practice was had, or one exactly similar, a thing only found on a continuous stratum in the same locality or kind of clay.

TESTING CLAYS FOR BRICKMAKING.

If a person desires to make brick, and has any concern as to the quality, he should first have some proper practical knowledge of the business. Then if he goes into a clay bed which is unlike that he has worked, he should take a fair specimen of the clay and have it tested in some brick kiln where brick are well burned. If no such kiln is convenient take some of the clay and wet it, letting it soak over night, then divide the specimen and temper one-half well without adding any more water to it than was used to "soak it," mold it in the form of a small brick; then temper the remaining half in the same way, adding water to it once or twice or three times, so that it will become much more plastic than the first half, then mold it likewise and put both specimens in the sun to dry. If the clay has much lime or alkaline matter the sample tempered and watered most will crack in the sun and melt under a low heat, while the first specimen, watered and tempered only once, will not crack and will stand fire better than the other. Most people think that the more clay is tempered the less it will crack in drying, but the reverse is true. Clay is one of the most powerful hydrates known; it never parts with water until at nearly a fusible heat. Clay absorbs water in being tempered until disintegration is complete, hence it may be watered from three to five times during the process of tempering, and its toughness and plasticity increased every time water is added. If clay be "loamy" and weak it may be made stronger by repeated wetting and tempering. The analysis of clays shown in the books cannot be relied upon unless made from a fair specimen to be used. I will, in my next, give a simple way to make an appropriate test of clay without burning it; but nothing but a proper, fair, practical test, will tell the truth about clays. Practice and science are so closely and necessarily allied in clay-working that none but "botches" will dispute it.

MANUFACTURE OF PLAIN AND ORNAMENTAL PRESSED BRICK---HOLLOW BUILDING BLOCKS, ETC.

*BY R. C. PENFIELD.

Mr. President and Gentlemen of the Convention:

This subject to which we have been assigned comprises more than can be properly treated in a paper suitable to be read before this Association. We will therefore drop out the ornamental pressed brick portion and so much of the hollow building block part as should be treated from the stand point of hand made terra cotta and confine our remarks exclusively to such blocks as can be made on a dry moulding, stiff clay machine or press. Hollow building blocks is certainly a dry subject and it is doubtful whether we will be able to demonstrate that it has merit either from an economic or an artistic stand point, to give merit to our effort.

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*Read before the Ohio Tile, Brick and Drainage Association.

Is it not passing strange, if there is anything in it, that it has gone so long undeveloped, or is it one of the lost arts or useless arts? So far as we know the use of hollow building blocks for general building purposes has never been fully developed in this country. It is true at Cuyahoga Falls, buildings and foundations have been constructed of vitrified hollow blocks of a dark brown or stone ware glaze appearance, that gives one the impression at once of an old jail, and is a failure from an artistic stand point; The Pioneer Fire Proof Construction Company of Chicago, have an office built of that kind of material, that is a good effort in that direction and has more artistic merit. There may be other buildings in different portions of our country but the journals devoted to this art do not, and have not shown how hollow blocks of burned clay can be utilized for general building purposes. Our experience in their manufacture and in the construction of buildings connected with our manufacturing establishment has demonstrated the fact that blocks do not want to be made too large. The first building we constructed was made of blocks 8x8x12 inches, with only one partition through the centre of the block.

One difficulty with the size of this block is to make them long enough to give the proportion. A block ought to be made three times as long as it is thick to be any where near the relative proportion of a brick. This would require an eight inch block to be 24 inches long. Any one conversant with the manufacture of tile will readily concede the difficulty in making blocks that long and have them straight. The loss in the manufacture of blocks that size and length would be much more than smaller ones and more inconvenient to handle, both for the Masons as well as for the manufacturers. For general building purposes the blocks ought not to be more than 12 inches long on account of the openings and then the architects should space the openings with reference to the length of blocks as nearly as possible. We have established as a proper thickness for a standard block 5 inches. This is equal to two courses of brick, and makes it convenient to make a bond where brick are required as in chimney breast, etc., etc. Having established the thickness, the relative length naturally follows. For proper proportion, the most pleasing effect will be had if this block is 15 inches long and it might be well for first class jobs to make the front blocks that length. This involves another difficulty and that is making the corner blocks. In every instance the corner blocks are made with what we call a side cut die and cutter, and as the ends of the blocks must be one half the length, this would require a block 7½ wide by 15 in length. This is a large block to make, but it can be done with no particular trouble. The difficulty is in loss by the ordinary accidents of manufacture and the loss of one large block is greater than a small one and the liability to loss is greater with the large than with the small. The rule should be not to make blocks longer than 12 inches and then the corner block will have to be only six inches wide to make the bond correct. About three grades of blocks as to width will accommodate any building from a cheap cottage to a mansion. To commence with a cottage, we would make a block 5x8x12, corners 6x 5x12, holes running vertical, side cut. A wall constructed of one course of these blocks would be equal in strength to an 8-inch brick wall, and the plaster can be placed on the hollow wall direct and save cost of lathing it, etc. Now the next combination for heavy or thicker walls, can be made by using in connection with these blocks, a block 4x5, and if it should be desirable to make an air space, these blocks can be made one or two inches apart, using the 4x5 for the inside courses, and alternating every six courses, putting the 8-inch block on the inside and the face block 4x5 for the front. This will make a 13 or 14 inch wall with an air space of 2 inches if desired, or a 12-inch wall without the air space, and in either case, a wall bound thoroughly and very strong. With these two sizes of blocks for stretchers, a number of combinations can be made. Should it be desirable to make a 16-inch wall, two courses of 8-inch blocks can be used and occasionally a 4-inch block used to tie courses. Four dies are all that are required to make any of these combinations. One for corners 6x12, this is a side cut die, with shell 1½ or 2 inches thick, one for the window and door jamb, 6x6, cut 5 inches long, same as corner blocks to correspond with the thickness of the stretcher. The walls of these blocks or shell should be 1-in. thick, more or less according to the quality and strength of the clay. The corners are side cut blocks and should have a shell as remarked above not less than an inch and a half in thickness because it is important to have a bed for mortar in raising the corners.

Now, gentlemen of the convention, you have a short but concise description of the coming building material of the country. If the details are followed and the mason work well done with the blocks as above described a cheap, durable, dry wall can be made that will far excel in beauty and cost an ordinary brick wall, but our theme is just begun. We have the subject only just blocked out. I have described only a plain smooth wall with no ornamentation, not even a round corner. When it comes to a question of art the field before us is limitless. Varieties of mouldings that can be made on the face of blocks for special use as water tables, belting courses; cornices, trimmings around the windows, etc., etc., are too extensive for more than mere mention in a paper of this kind. Also beaded work, either coarse or fine or the two combined in the same block, or what is called in stone work Crandall finish. These and numberless other kinds of finish furnish opportunities for the student of art to expend his best inventive skill in planning combinations for beautifying and ornamenting to a degree far beyond our present conception and will at the same time add but a trifle to the cost of constructing, beyond the use of just such a plain, smooth, simple block. The cost of a mould is small for the manufacture of either plain or ornamental blocks so that the manufacturer can afford, if he has to, almost any design at a trifling expense over a plain block. We have made no mention yet of the possibility of producing beautiful varieties for artistic affect, of the various combinations that can be made with brick or terra cotta work mixed in with the different varieties of building blocks, but will here remark for the benefit of those interested in the development of this material that we will be pleased to more fully explain or show samples of the work that we have in its present development, at any time you may choose to give us a call.

J. W. Penfield & Son.
Willoughby, Ohio.

Mirage.

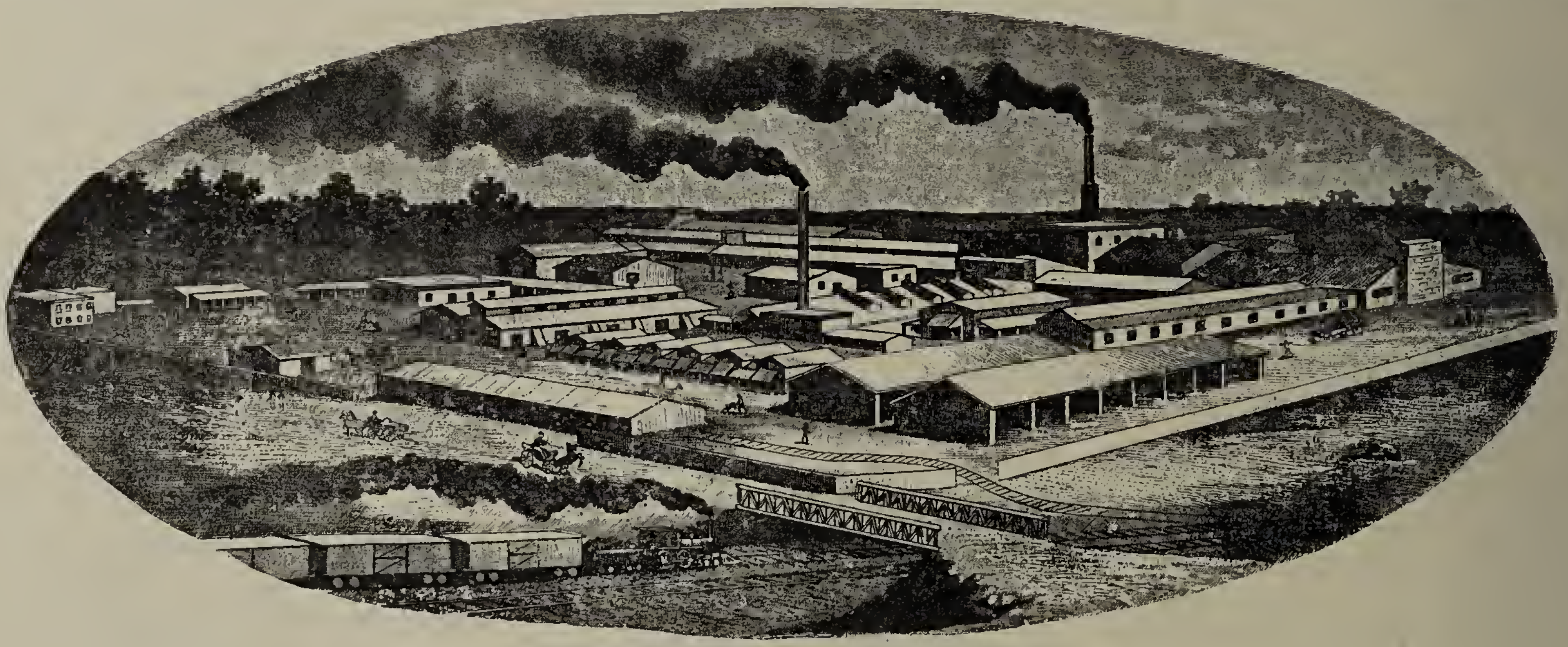
We'll read that book, we'll sing that song,
But when? Oh, when the days are long;
When thoughts are free and voices clear;
Some happy time within the year—
The days troop by with noiseless tread,
The song unsung, the book unread.

We'll see that friend and make him feel
The weight of friendshib true as steel;
Some flower of sympathy bestow—
But time sweeps on with steady flow,
Until with quick, reproachful tear,
We lay our flowers upon his bier.

And still we walk the desert sands,
And still with trifles fill our hands,
While ever just beyond our reach,
A fairer purpose shows to each.
The deeds we have not done, but willed,
Remain to haunt us—unfilled.

THE MANUFACTURE OF MOLDED AND ORNAMENTAL BRICKS BY THE PEERLESS BRICK COMPANY.

The progress that has been made of late years in the art of brickmaking is very marked indeed. In years past little attention was bestowed upon the character of brick used except the mere regulation size of the locality where they were to be used, and sufficient hardness. They might be rough and off in color to an extent that made the building have a motley appearance, but little or no objection was found to the brick on account of such defects. Durability and utility were the points of excellence. A few manufacturers have in the last few years announced the determination to elevate the art and they have been nobly assisted by the leading architects of the country. How far they have succeeded toward this end is shown in some of the more recent brick structures in the leading cities of the country. Notably in the lead in this rapid stride in the elevation of art is the Peerless Brick Co., of Philadelphia.



Works of the Peerless Brick Co.

We had the pleasure last year of spend a brief hour in these works examining the stock of pressed and ornamental brick in store and others in process of being loaded for shipment to various parts of the country. The line of goods manufactured at their works embrace plain, moulded and ornamental brick, which includes panels, mouldings, etc.

We herewith present our readers with an illustration of the Fireplace in their office, also an illustration of their works.

The daily output at this season of the year is about sixty thousand, divided as follows: Twenty thousand face or front brick, twenty-two thousand stretchers (a term used for second quality face brick), eight thousand moulded and ornamental bricks—the ballance of common bricks.

The following is their mode of making pressed bricks: A bar of clay of the required length and thickness for a brick say 8¾ by 4⅜ is pressed from a machine; the bar is then cut by wire into bricks of 2¾ thickness. These are hacked 500 on a car and run to a Cornell power press. The brick here are first dipped into fine sand and fed into the press. After being pressed they are hacked on pallets and stand twenty-four hours to partly dry, after which they are repressed by hand, set on cars and run into drying tunnels. The "stretchers" go through the same process except they are not repressed by hand. The "common" are cut at the machine and go directly to dryers. The "ornamental" brick are made by hand of tempered clay one at a time and laid in rows on a heated floor where they remain twenty-four hours, then pressed into the requisite shape, loaded on cars and run into drying tunnels.

DRYERS.

Imagine a room 50x100 feet and 4 feet high with tracks running through lengthwise with a space 15-in. deep underneath the tracks in which there is a 1½ in. steam pipe, say about 1500 feet of pipe which is fed with live steam at a pressure of 70 pounds. Each track of 100 feet will hold 12 cars, each car carrying 500 bricks. In the roof of the dryer over each car is an opening 8 in. square which allows the moisture to escape. About 30 hours are required to dry the clay in this way.

BURNING.

The Company have 7 Melcher Kilns of 250,000 capacity each. The floor of the kiln looks like a large grate made of fire bricks. On the grate or floor is set two or more courses of common bricks. On these are set pressed or moulded bricks until within three courses of the top—the three top courses being common bricks and the latter are "salmons" when burned and about all the soft brick they get.

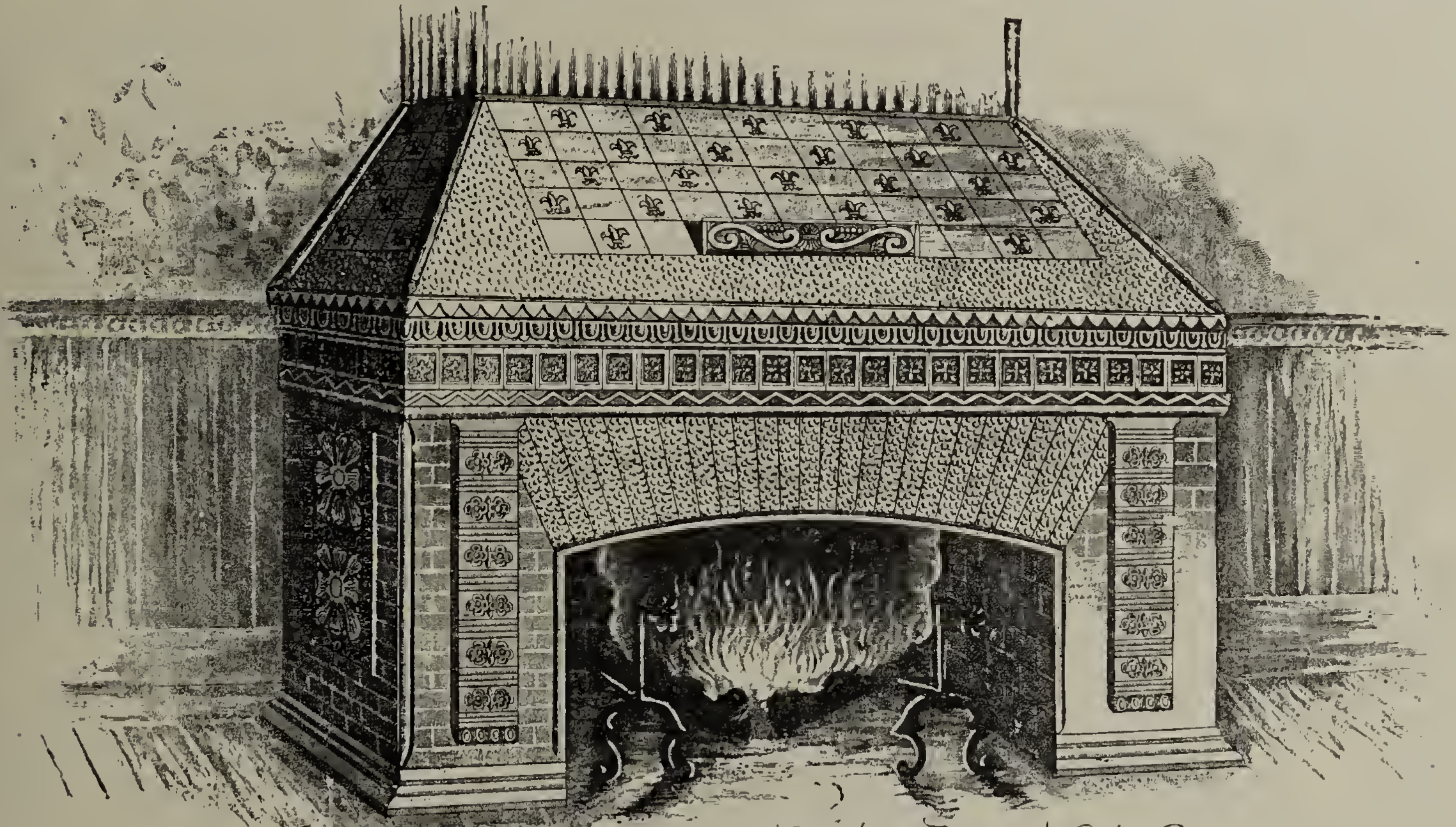
SIZES OF BRICK.

They manufacture the following sizes: pressed brick 8⅜x4⅛x2⅜, stretchers and common the same—8⅜x4⅛x2¼. The pressed brick are made 2⅜ inches in thickness which is ⅛ thicker than the "common" or "stretchers" for the reason that the masons lay ⅛ joint in laying pressed brick and ¼ for common and stretchers which brings the work up bonded on the front walls without any broken work on the corners.

The Company gives special attention to the color of brick and have done much to popularize this feature in brick manufacture. They are also adding from time to time new forms or designs in ornamentation and suggestive combinations.

An able English writer says: "Our buildings both outside and inside should have some of that warmth which color only can give. They should enable the educated eye to revel in bright tints of nature's own formation while to the uneducated eye, the best of all possible lessons and by familiarizing it with the proper combination of color and form would be enabled to appreciate it."

It is a pleasure to give space to those who are helping to educate to higher standards of excellence and beauty. The art of combining colors and designs of ornamentation so as to have a pleasing effect to the eye, contributes to the higher education of our taste and is every way elevating.



Brick Fireplace in Office of Peerless Brick Works

VARIETIES.

*BY J. G. WAGNER, COVINGNON, O.

From a subject so vague, none will know what to expect, and no doubt it would be better if it were not only vague but were not at all.

We have so often heard of the best kilns, the best machines, and the best methods, but we never hear of the best man, the one most careful, faithful, watchful, given to looking around to see, not where he can blame the clay, the machinery, the kiln or the process, but to discover his own carelessness and inefficiency. There is more in the man, than in all the appliances. The pluck that braves failures and the energy that overcomes difficulties are the two pots of gold on which our business rests. The drone with us is a useless superfluity, and the average man who has fallen in the habit of experimenting and inventing, is beyond the hope of redemption. But system, order, economy and industry always guarantee success. Pinch yourselves once in a while to make sure that you are awake. A sleepy tilemaker, a lazy brickmaker, are some of nature's misplaced excrescences. You need to be stood on your head once in a while, turned inside out, purged of some of the old fossil oft-repeated ideas, and that is what I am after, but may not be able to accomplish. Look out for a storm in a tea-pot. Something that will keep your heads cool, from the effects of the heat of the argument.

My neighbor A puts West Virginia oil ("black-strap," he calls it,) into his boiler. What for? To blow it up? As likely as not.

Mr. B has a solvent that effectually cleans his boiler, but alas, he is not aware that it will eat through the iron and compel him to buy a new one. It is cheaper to clean a boiler than to buy a new one. Boilers generally should be, not only washed out, but cleaned out once every two weeks. I must here enter my protest against blowing off boilers with any pressure whatever, for the rapid change from a pressure of 10 or 20 pounds to nothing and the cooling of the metal caused by the change of the heat, must be injurious to its structure.

Mr. C wears out his belts by using rosin on them, instead of keeping them well oiled from the outside, and I am not so sure but what he runs them upside down.

Neighbor D puts up a new iron stack once every three or four years when he could make the brick for a stack that would last a century.

I wish you to understand that I am not a chronic fault finder, but I started out on this line and I am going to fight it out if it takes—all your good will. "Little strokes fell great oaks," and little mistakes eat up great fortunes, fortunes made out of clay banks.

Many tile yards and brick yards present the most disorderly, irregular, unsystematized, disagreeable spectacle in the neighborhood. Why so? Does the business bring the habit? Or the habit the business? Some tilemakers seem to have a place for everything, but they frequently forget where the place is.

It takes some of us a lifetime to learn how to arrange our works for economy and success. If your works are conveniently arranged, tile trucks are cheaper to use than wheelbarrows or cars and tracks, and much less in cost. The least investment with the best yield in quality and quantity for the lowest cost, is what we must strive for. A little sand, short clay, loam, saw or coal dust, may save you much loss and labor on your brick or tile, so may a little more regular burning and slower cooling. Perhaps your dry sheds have too much air in the start,

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***Read before the Ohio, Tile, Brick and Drainage Association Feb. 12, 1889.**

or not enough later. Perhaps you set your tile too green, or too close, too high or too uneven.

Now, for a little variation in our humdrum essays on old and often handled subjects. We have made the nearer acquaintance of the unmatched Colonel Sellers in order to find a scheme with millions in it.

We assert that the time will come when mountains like Stromboli and Cotapaxi will furnish from their ever issuing internal fires the fuel for smelting your metals, for burning your earthenware, yea, perhaps even for cooking your meals, and who knows but what the time will come, when, by holes bored through the outer crust of this earth to that vast immeasurable reservoir of internal fire, our larger cities will be supplied with heat and fuel. There is millions in it.

The attendance at our conventions has been waning, until even the machine men and the patent kiln men are no longer to be depended on. Not that the instruction given is no longer needed, but less appreciated; perhaps, too, it does not always reach the maximum in interest and value. The real reason, however, is that the number of beginners is growing less and that the profits are sensibly diminished by the low prices. It is evident that if this continues our attendance at association meetings will become so slim as to seriously endanger its very existence.

You will excuse me, then, if I suggest that in place of the several state associations, one National association might prove of more interest, in that it would have the whole country to select from, for its contributors, while in its peripatetic course over the country it would arouse interest in states and places where now its existence is neither known or felt. This association could then perhaps be advantageously divided; say, into brick department, drain tile department, pottery, sewer pipe, terra cotta and other departments. While in all pertaining to clay, its preparation and burning, all could participate in common. Such an association should have a historian and an historical committee, to compile into proper form for publication, whatever of interest that could be gathered of the art from ancient to the present time.

It was a matter of surprise and chagrin to the writer, to find that the literature of the German language, pertaining to clays, the making and burning of earthenware far exceeds that of the English language.

The association should also have a statistician, who with the assistance of manufacturers and machine men could collect for the association or revise for and assist the Department of Mineral Resources of the United States Geological Survey, to make a collection more reliable than that department has been able to obtain so far. There are in our country about 2500 tileries, with an average production, (home value) of about $3,000 apiece, making a total for the United States not to exceed $8,000,000, yet the report named places it at $14,000,000, simply because the larger factories report while the smaller ones are seldom heard from.

We find that of clay and its products, viz.: china, porcelain, earthen and stoneware crockery, tiles, common and firebrick, etc., there was imported in 1887 about one-sixth of all consumed, while the home product amounted to about $48,000,000.

Why can we not produce the one-sixth more and thus keep at home the money sent abroad?

We have in this broad country all kinds of clay and a national association properly managed could be made an effectual instrument in locating and developing our clay beds. Having such an ample supply of clay, if we have not enterprise enough to make what wares we need, we should be compelled to do without them.

CUTTING PRICES.

No one thing has done more to demoralize the tile business than the cutting of prices. And much of this is the result of inexperience in business. Every clear headed business man knows that to sell a product below cost tends to bankruptcy. The result of continuing on this line is as certain as the revolutions of the earth. The past two or three seasons have either been dry or at most seasonable, so that the demand for tile in many localities has not been so good as in years before. Some tile manufacturers who probably went into the business without any knowledge of it, and with little capital have found themselves financially embarrassed, and hoping to tide over, they have offered their tile at rates much below cost, and others have felt themselves compelled in some sense to meet the competition with cut rates, until in some sections the trade has been badly demoralized.

A tile manufacturer of our acquaintance, well located, with no experience and little capital, began this cutting of prices to force sales, to raise a little money. The more he cut the less the farmers bought, they would talk about buying, but said, "Tile will get cheaper." They understood the situation of things. They did get cheaper and were sold at Sheriff's sale. Another manufacturer who was effected by this cutting of prices, said: "My tile cost me more than the prices at which my competitor offers his. My tile are good; they will keep, and they may stay on my yards until these things adjust themselves." And strange to say, the best farmers bought tile of the latter rather than the former, why, we are hardly ready to say, except it is, that there are, in all good neighborhoods, level-headed men, who approve of doing business on sound business principles. And are more ready to patronize such trade. We have, however, known of one man who drove six miles and back over a bad road to save 75 cents in a load of tile and did not get as good an article. But we suppose that such skinflints will be found, as long as men tabernacle in the flesh.

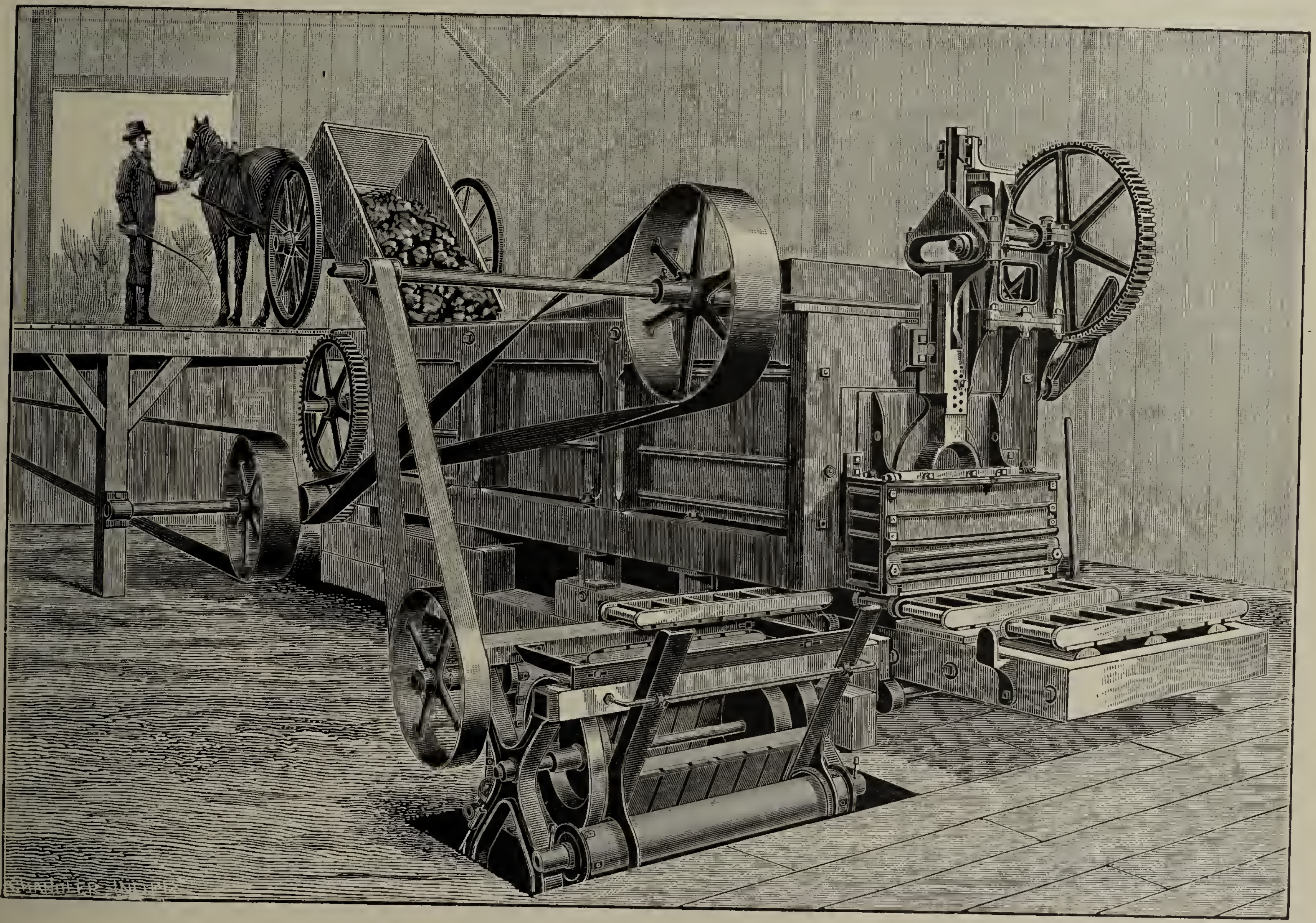
However, we do believe in progress, and expect them to grow less in number and less in public opinion. The thing to do, is, to make good tile and sell them at remunerative prices, or hold until the demand does take them. In this connection we venture to say that if some of our tile manufacturers would take the pains to ascertain what their tile actually costs them, it would have much to do in stiffening their spinal column in the matter of prices.

CARE OF MACHINERY.

Manufacturers estimate that twenty per cent. of the wear of machinery comes from neglect to keep the bearings properly oiled. The object of oiling is to keep the wearing parts from grinding each other out, and good oil keeps the parts from coming in contact as they roll or slide on the slippery surface. The best oil that will not "gum" is the only oil that should be used, as it is the only oil that accomplishes the purpose for which it is intended. Good oil spreads quickly and friction is reduced to the least possible amount. If too much oil is used it is wasted; if too little, the metal surface comes in contact, heat results, the metal expands and the bearing surfaces are cut out of wear. In textile machinery, especially it requires a good deal of study to know just when to oil and what bearings need most frequent attention but the time given to master the subject is well expended and save much cost in "extras."

A SUCCESSFUL BRICK MACHINE.

The illustration herewith presented to the readers of the Clay-Worker represents the Potts Horizontal Stock Brick Machine with their improved Mold Sanders attached. The first machines manufactured, after being fully tested, were put upon the market in the fall of 1887. While this machine involves no new, or untried principle in its construction, Mr. Potts, however having had several years experience with brick machinery, was fully acquainted with the objections urged against the various devices in use in the construction of this class of machinery and in the construction of this machine had it fully in view to overcome the objections and has succeeded admirably, the principal being the well known vertical press box and plunger. The Horizontal Machine consists of a horizontal pugging box 12 feet long, 30 by 30 inches inside. The tempering shaft extends the entire length of the pugging box and is made of 3½-inch steel, which has all the strength likely to be required under any circumstances. This shaft is operated independent of the press which fills the molds, so that any number of revolutions may be had to each mold necessary to temper the clay perfectly.



On the end of the pug shaft next to the opening in front through which the clay passes into the press box, is a large double feed wing which forces the clay in a straight line into the press box, consequently filling it all the time evenly full of clay, however stiff the clay may be. The molds have always a uniform pressure, therefore the bricks have the same density and size when burned.

This machine works the clay directly from the bank without the use of an extra pug mill required by the vertical machine. The pug box is open on top the entire length, which enables the man who attends to the tempering of the clay to see its exact condition until it passes into the press box. The temperer can have no reasonable excuse for allowing the clay to get too wet or too stiff or unevenly tempered.

By referring to the cut the reader will see that this machine has no light or complicated machinery or parts underneath liable to injury by the constant falling of dirt into them thereby causing the cutting and unnecessary wear occasioned in this way, and which is so objectionable; but to the contrary, everything is out where it can be cared for and kept clean.

These machines are provided with automatic reliefs in case a stone is caught between the mold and die, which not only protects against damage, but in addition the operator can lower the table quickly and remove the obstruction in a moments time, and then the work goes on.

The machine, as a whole, is so simple in its construction, and the relation of part to part so easily seen, and the relative strength so fully provided for, that inexperienced men have succeeded from the start in operating it to their entire satisfaction. While it is not possible, perhaps, to make a machine that will meet the requirements of the "Deacon's One Horse Shay," to run a hundred years and when it failed, every part to fail at the same time, yet, it is believed by the manufacturers and those who have tested it so far, that in the years to come this machine will be found to be durable, easily operated, and in every way satisfactory.

THE MOLD SANDER ATTACHED.

This machine is the result of careful experiments which have been made the past few years. It needs to be seen in operation to be fully appreciated. For a full description of this machine, or of our full line of clay machinery, please send for catalogue and circulars.

A. Potts & Co., Indianapolis, Ind.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN BY CORRESPONDENT. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Supplemental Paper on Brick Tests.

Editor Clay Worker::

Since writing the article on "Testing Brick," which appeared in the March CLAY-WORKER, I have received samples of brick from three makers not included in the former list. These bricks were contributed by the makers unasked, and were also selected by them. Unfortunately the number of brick sent was too small to make a satisfactory test. Also the tests were made in connection with another series of experiments, and not simply to determine the qualities of these brick; and hence the results do not show the qualities of the brick as well as they might otherwise do.

One lot of brick, which for convenience of reference will be called No. 16, were evidently dry-clay, machine-moulded (pressed) brick, very regular in form, uniform in texture, burned appreciably harder on the outside than on the inside. The absorption, which was quite uniform, was 9.7 per cent. (the mean of seven trials). The modulus of rupture was 1,202 pounds per square inch. The crushing strength of 2-inch cubes, (the surfaces,being smooth,were not plastered), was 1,375 pounds per square inch (the mean of two trials). A brick on end stood 9,420 pounds per square inch. A pile of three half brick (harder burned than the above) stood 6,700 pounds per square inch.

Lot No. 17 was apparently two stiff-clay,die-moulded, end-cut brick. The absorption was 5.8 per cent. The modulus of rupture was 1,665 pounds per square inch. A brick on end, the bed surfaces being plastered, stood 4,400 pounds per square inch.

Lot No. 18 was apparently two stiff-clay,die-moulded, end-cut brick. The absorption was 8.1 per cent. Two brick on end with plastered bed-surfaces stood 5,110 and 4,080 pounds per square inch, respectively.

* * *

I have received a letter from a gentleman who supposes himself to be the maker of brick designated as No. 15 in the former article, in which he expresses surprise that I should have found so much absorption (2.2 per cent. for *whole brick*).

I have repeated my experiments for the third time—the second time, before writing my former article, to satisfy myself and the third to satisfy my correspondent,–and get almost exactly the same result every time. I also asked a gentleman of unquestionable scientific ability, to determine the absorption in his own way. He weighed several *small pieces* on chemical balances, immersed for 24 hours, dried with bibulous paper, and weighed. His mean result was 4.8 per cent. The difference in results is due to the difference in methods. However, the difference between the results by the two methods is extreme, since this brick had a somewhat impervious skin.

I. O. BAKER.

University of Illinois, Champaign.

Convention Brickdust, No. 3.

Editor Clay-Worker:

I am happy to say I am one of the survivors of the late Brick Manufacturers' Convention held at Memphis, Tenn. Although still feeble, my friends have some fears that I may recover. My old friends with a few exceptions were there, and the good citizens of Memphis were there too, and stayed right with us until the last night after supper. They wined, dined and banqueted us, until we began to feel too large for our apparel, hats especially got entirely too small. Particularly was this true of the distinguished humorist from Terra Cotta, Ill.; I know this by sad experience, for he wore my bran new election hat home and left for me that ancient hat which he had won four years ago. I know it is his hat as I found a card under the band, with some indescribable legend printed upon it, which I could not decipher and would not have known who owned the venerable relic, had I not recognized Gates' portrait on the left hand upper corner, better known as the "Terra Cotta Man," whose smile caused St. Peter to set the heavenly gates ajar. I fear, however, Picket's beautiful dream will never become a reality. Since he took my good new hat, and left that aged one for me, I have been taught always to respect old age, hence I will draw the veil of charity over this antique head gear. *Requiescat in pace.*

Yes, we had a successful meeting, a beneficial and happy meeting. Our president was there and has lost none of his popularity among the members and had it not been that an unwritten law forbade a second term, he could not have escaped a re-election; he retires from his distinguished position full of years and honor. By the way, as an after-dinner speaker, as a before-dinner speaker, also as an after-supper speaker he proved a great success. He also made a record as a daisy speaker between meals. We didn't have the pleasure of hearing from his eloquent lips a before-breakfast speech, but we believe he can do that if the occasion demands it.

His predecessor, my distinguished friend from Cincinnati, was only second to him as an impromptu speaker, always ready to speak to the point on subjects that came before the convention, rather retiring in disposition, but can be induced to say "just a word or two" when called upon.

Then my esteemed friend from Denver, but formerly of Philadelphia, was a close third in the race for oratorical honors. The gallant Captain from New England came next and led Colonel McCain a lively race for third place.

Our new president won hosts of friends by his genial way of greeting and conversing with those he met. He will make a popular, earnest and faithful executive, and is ably seconded by first vice-president Ittner, of St. Louis, a master hand at controlling large bodies of men. He is gentle as a dove and firm as Napoleon 1st. He was the Warwick of the convention—refused the presidency but named the president.

Early in the session a committee was quietly appointed to keep a *watch* on Randall during the balance of his natural life, to see that he came and went and always got the Clay-Worker out on time. This proved a *golden* opportunity for them, and they succeeded in *chaining* him to his post of duty, and were discharged with the thanks of the convention. Randall accepted the situation like a true clay-worker, and wore his chains with a heroism worthy of Saul of Tarsus. In addition to this he was just from President Harrison's own home, as were my old friends Adams and Fletcher. This trio were burdened down with the great responsibility of properly representing this most important city. They, however, were equal to the emergency and neither General Harrison or the beautiful city they came from had anything to fear with such able and enthusiastic sponsors to represent them. Adams' speech at the banquet was timely, eloquent, patriotic, and was heartily endorsed by all present from whatever section of the Union they came. I always *look up* to friend Adams when I meet him, his genial smile (like everything else about him has no lack of breadth) and attractive face are pleasant to contemplate, even when some of the boys at the play stuck a postage stamp on top of his head, he never got mad. He is the largest man in the convention with a heart in proportion. When we meet in Indianapolis presidential lightning will most certainly strike my good friend.

I hope that every member will be dusty when I have finished.

A—C—MEMBER.

Among the Brickmakers.

Editor Clay-Worker:

If I remember correctly the January number of the Clay-Worker left me at Omaha, Neb. From that great and growing city I journeyed to Lincoln, Neb., where, I had been informed, I would find one of the best equipped paving brick plants to be found anywhere and I must say I was not disappointed.

The Vitrified Paving Brick Company's plant is quite large, having a capacity of 100,000 paving brick per day. The clay is brought some three miles by rail and dumped into pits from which it is shoveled on to a long belt, carried to the crusher, then to a large pug mill from which it is delivered to a Penfield Machine. From the machines, (there being two of them, in fact they have two separate and distinct plants so far as engines, crushers and machines are concerned) after the brick are made they are placed on wooden pallets which are set about six high on iron cars. These filled cars are placed in tunnels heated by the exhaust steam from the engines.

They have 30 tunnels 100 feet long and are now fitting up 30 more. The brick are run on the cars to the kilns, of which they now have five of the Eudaly square down draft kilns, holding 225,000 each, and are building two more to hold 300,000 each. The kilns are lined entirely with fire bricks and are so arranged as to back a wagon into them at either end, or load into the railroad cars direct from the kiln. I here found a very fine grade of plastic fire clay, from which they were making a very excellent paving brick. I think brickmakers who can find the time will do well to visit this plant as it is one of the most complete in all of its parts that I have ever seen.

I next visited Wm. John Fitzgerald's yard at Lincoln, which I found to be a very large yard. They were running a Chambers Machine and were turning out good brick. Until recently they have been burning in the old-fashioned kiln, but are now putting in the down draft kiln. They already have two small common down draft kilns and one large Eudaly square down draft kiln. I was informed on the yard that they would put in enough of the large square down draft kilns to burn all their brick. I might mention also that they have an Acme dry press machine and are turning out some good brick with it now that they have the down draft kiln. Mr. Fitzgerald has the making of a splendid brick plant.

The clay about Lincoln is of a very peculiar character. It lays in a belt extending from a few miles north of Lincoln down to Beatrice and is found from five to thirty feet below the upper strata of loam and sand.

Lincoln is to have 20,000,000 paving brick laid this season. Stout & Buckstaff have the contract, as well as that of putting down several miles of cedar blocks. Mr. Stockwell, the pioneer in the brick business at Lincoln, also has a good yard. Has a Penfield plunge machine and is drying and burning in the old way. He will put in down draft kilns this season. Lincoln bids fair to be a paving brick centre.

At Weeping Water I found the Boyd Dry Press, a splendid bank of clay, the old-fashioned kiln and a lot of soft brick. They are going to put in the Eudaly Kiln this spring and will no doubt turn out a very fine brick.

At Atchison I did not find many things pleasing to the brickmaker, except the clay, which makes very excellent paving brick. Benning, Beaty & Ellis were running the Little Wonder with good success. They were drying by means of condensing the water in the moist air after it had left the brick, or, in other words, condensing the moisture in the air by causing it to pass through coils of pipe through which cold water was forced from the well to the water tank. This to me was rather a novel way of getting the water out of bricks. To be more particular in my description, the bricks were placed on cars and run into tunnels which were heated from the bottom by coils of steam pipes. The moist air was then carried up to an upper room or space where run a second coil of pipes through which was forced cold water from the well to the water tank. The moist air from the brick coming in contact with these pipes is supposed to lose its moisture, the air returns to the brick below for a fresh supply of water while the moisture is carried out of the building by a drain trough.

The brick at Atchison are all being burned the old-fashioned way, with about as much loss as I have ever seen. They are losing more brick than would if burned properly pay for the entire running of their plants. One yard had spent considerable money putting in the Iron Clad Dryer, but a small fire came along, supposed to be caused by the malice of one of their men, and all they now have left is an Acme Machine and the necessary engine, boilers, etc.

At Atchison I found quite a number of blocks laid with paving brick; one entire street from the brick made at Galesburg, Ill.

I next stopped at Leavenworth but did not take the time to visit the brick yards as the Soldiers Home was my objective point.

Taking the 'dummy" at Leavenworth, I was soon landed at the home. By the way, will some one explain why these small suburban trains are called *"dummies?"* The Soldiers Home at Leavenworth is quite new, but few if any of their streets are paved. They have, however, a splendid clay for street paving. Mr. John, the civil engineer, had just returned from an extensive trip East, the object of which was to look up machines, kilns, etc. Col. Smith, the governor of the home, informed me that they would put in the Acme Machine and the Eudaly Kiln. It is their intention to put in several miles of pavements as soon as they can. And in my opinion they cannot do it any too soon. Imagine 2500 disabled soldiers wading around in mud; it is anything but comfort I assure you. I will say, however, that they have one of the most beautiful locations, naturally, that I have ever seen and will in time, no doubt, be equal to anything of the kind in the United States.

I next found myself in Kansas City but as there is so much to be said about the brick, streets and buildings of this city, and as I have already mentioned Omaha, it would not be wise to say much concerning Kansas City, the two being rivals.

I find I have already written a great deal and said but very little and with your permission will write something further in the future. A STUDENT.

Thinks Contra-wise.

Editor Clay-Worker:

We derive a good deal of information and some amusement from your magazine. For instance, some one from Indiana, where they have natural gas, says "it is but a question of time when Indiana will supply Illinois with brick, on account of cheap fuel," (i. e. natural gas). This makes me laugh, as the total cost of fuel (here) for making and burning 1000 brick is but fifty cents, (can he say as much), and fifty cents in this part of the country will not pay the freight very far on a thousand brick.

LUKINS & CAVANAUGH.

Streator, Ill.

Preparation of Clay for Land Tiles.

Editor Clay-Worker:

This is a matter that in the writer's opinion is well worth studying by manufacturers, for in this part of the work it may be said that the quality of tiles are so far regulated. Generally, clay is taken direct from bank and dumped into the machine which serves both for milling clay and making tiles. My idea is that it would be a profitable investment to expend say twelve or fourteen cents per cubic yard in wintering it, *i. e.*, begin to excavate from the bank, say about the end of October, and continue on till ready to commence the summer's making. The process is simple—where there is an open space, cast the clay off just as far as will keep the workmens' feet clear, with an ordinary spade. By so doing it is subjected to the frost of the winter months; is made more plastic for working, and consequently requires less milling and produces better tiles. I might add that the clay taken from bank in the early months of the fall and during the month of January, since they are subject for a greater time to the action of the frost, should be used in the earlier part of the making season while that put out in February, March and April should be reserved for use during the latter portion of the making season. The effect of the frost in the spring months, together with the subsequent 'souring' through the summer months, makes it (the clay, risen during February, March and April,) just as available for first-class tiles as that taken from the bank during the preceding fall. Where it is not convenient to cast it off with the spade, it costs but very little more to wheel it off in trenches, covering on these trenches say two or three feet thick every day. Where the clay is of a strong, unpliable nature it is an advantage to have it dug or cut small so that the weather gets at it better. It is also an advantage when turning over to shower a quantity of water on it. In the event of any stones being in the clay this turning over enables them to be taken out. Where the clay is of a loamy nature it is no great advantage to winter it. Strong clay is what derives most benefit.

The foregoing statements are applicable also to hand or plastic machine brick making. If brick clay was so prepared, it, like tile clay, would require less milling and diminish loss on the production, as well as make a better article.

G. W. B.

Brickmakers at Large.

Editor Clay-Worker:

In the brick business here the outlook for the present season is very encouraging. Sales are being made rapidly, both for immediate and future delivery. The prices for common brick are about the same as this time last spring, and the demand equally as good; but the pressed brick are sticking at, or about, the lowest prices quoted last fall, and not a very heavy demand for them at that. Still, with the opening of the waterways to New York and through this State, I think the trade will be agreeably surprised with the amount of pressed brick that will be called for during the next two months. It looks very much like a return from Trenton to Philadelphia brick among the New York trade, and consequently brighter prospects for the Philadelphia brickmakers in the near future.

The output for the season will be greatly increased by the erection of at least six new machines and the addition of a number of hand gangs for the making of common brick. The pressed brick will be made very sparingly for a time by some firms, while others intend starting the same number of gangs as usual, hoping for a better time to come.

The wages have been agreed upon for the ensuing year by the committees representing the employers and employes, both committees having full power to act. The list will be printed without further delay. This, taken along with the good, dry weather we are having at present, gives the appearance of an early start which will be pleasant for all hands concerned, as the bosses want the brick and the men are anxious for the work.

Mr. William Fennigan, of Fort Howard, Wis., a member of the N. B. M. A., has just left us after spending a week looking up his relatives and old-time friends that he had not seen since he left Philadelphia just 31 years ago, thus showing that in his prosperity he had not forgotten his old friends who may not have been so fortunate in the race for riches. He was treated right royally by his old schoolmate, I. B. McAvoy, another member of the association, by whom he was introduced at the Master Builders' Exchange where he was treated to a share of that hospitality for which the members are justly celebrated. He left here to go direct to Ohio for the purpose of purchasing a complete outfit for a drain tile manufactory, such as a machine, crushing pans, engine, boiler, kiln-rights, &c. He had with him a list of the advertisements for such machinery taken from the Clay-Worker to assist him in his purchases.

A party consisting of C. B. Siner, Thos. H. Flood, T. B. McAvoy, brickmakers, and G. W. Sharer, dryers, left Philadelphia on Feb. 27th for a visit to the celebrated Penfield Brick Machine Shops at Willoughby, Ohio. They arrived in due time and were met at the station by Messrs. Penfield, who immediately drove them to their shops where they saw what was both interesting and instructive to them. They were so well pleased with what they did see in the way of brick machinery that one of the party left an order for one of their new and improved brick machines, with the promise of more to follow, provided this one should prove as successful as expected.

On the way home they stopped in Pittsburgh to see if there was anything new in the way of brick machinery in use there. Mr. Chase, of Booth & Flynn, brickmakers, took them in charge, and to him they are indebted for many courtesies extended, he having devoted the entire day to their pleasure.

They arrived home on Sunday, March 3d, well pleased with their trip, and particularly well pleased with their treatment while under the care of Messrs. Penfield & Son. They all unite in saying "that if the Penfields treat all their prospective customers as they were treated, they must have a host of well-wishers throughout the land. F. B. McA.

Philadelphia, Pa.

Artificial Drying.

Editor Clay-Worker:

To keep my promise to sundry correspondents, and being also reminded by several circulars setting forth the great value of their own particular steam dryers, I will briefly state that I built a drying house for brick, which while not a perfect success, is by no means a failure. It is 138 feet long, 26 feet wide, 6 feet high, with a flat or nearly flat (2 feet rise in 13 feet) roof, covered with tarred felt and sand or gravel. The outside posts for the racks are about one foot from the sides, and the racks extend toward the middle, leaving a passage way of 6 feet for trucks to pass. Ten cleats in each space 108 inches long allow 10 pallets, 9 inches wide, with 18 inches for ventilating space between them, or 11 pallets with 9 inches space divided between them. On 10 pallets we can get 900 brick in each division. The posts are 35 inches from center, allowing 32 inches for pallets, 1 inch leeway, and 2 inches for the post. This will give 47 spaces on each side, in which can be placed 84,600 brick. We prefer not to stow too close, and so have put in so far only about 60,000 brick at once. We started with three rows of 2-inch pipe, taking the exhaust steam from the engine, but found so large a loss of heat escaping from the six ends that we are now adding 600 feet more on each side, making 2,000 feet of 2-inch pipe to radiate heat immediately under the racks, which passes up to 13 skylights in the roof. There are also 13 windows on each side of the building. We had two up-draft and two down-draft ventilators at the ends, but have removed them, as the shortest way out for the vapor-laden air is the best. As yet the bricks have not dried as fast as on the racks in the open air, but when burned they are certainly better bricks. We have not put down a cement floor, but ought to, as it would add much to the dryness of the place. I have never regretted building this dryer, and if we had not already pallet room outside for 175,000 brick think I should extend the system. I think $500 will cover the cost so far, but 1,200 feet of pipe will cost $120 more and expense of putting it down. We use the dryer as a reserve for days when it is too wet for the exposed racks. S. P. C.

New Haven, Conn.

Touching on Efflorescence.

Editor Clay-Worker:

It was my intention to attend the Convention at Memphis, but was again disappointed, having so much on my hands that I could not consistently leave home. Then, too, the distance was so great it seemed a great undertaking, though I am sure I should have enjoyed participating in the discussions. It is hoped that the next meeting will be held in Philadelphia or some eastern city and if it is, there will be a large attendance. Philadelphia would be a very desirable place for the eastern brickmakers. I see in the January Clay-Worker that the Convention gave attention to the question of efflorescence, a subject we "stay-at-homes" are all interested in. We have had some trouble with it here.

One case is a church built about five years ago. Last season the whitewash appeared under window sills in the angles and places mostly exposed to dampness. I would suggest that architects in making their plans and specifications might lessen the difficulty by arranging or constructing buildings with a view of preventing this. In burning brick, if they are set too green or if the water-smoke hangs on in places, the brick will come out marked in the same way this leads me to think that though the conditions are different, the cause is the same namely dampness, and that if we can prevent that we find the remedy.

If we put our brick in the kiln thoroughly dry there will not be so much of this discoloring which so mars the beauty of brick structures. F. L. H.

Oneida Co., N. Y.

Kiln Management.

Editor Clay-Worker:

First lay out the square for the kiln on the ground selected for your works—I prefer 33 feet, but some set them all the way from 30 to 45 feet. The length of the shed should depend upon the intended daily capacity. As to the height that the brick should be set, that depends upon the clay. Some very strong clays are set sixty-two brick high—set on edge. I would not advise setting at first more than thirty-two high, then the hight may be increased if the indications are favorable. When they are set too high I have seen the brick badly damaged, for the reason that when in a green state they were not able to bear the weight. In the process of burning there is another strain upon them which will damage them if set higher than the material will bear.

The foundation, or kiln ground should be solid, and uniformly so, or the setting will cause large cracks in the kiln which will damage many of the brick.

If the ground is wet or springy it should be underdrained to insure a good foundation. In some instances it is advisable to put in eight or ten inches of stone pavement in the foundation, then cover with six or eight inches of clay and pack well with rollers; but with a dry location there is no need of the stone. I burned two kilns of brick at the new plant at America for the America Brick Company. The first work on the yard was commenced last July. The works were completed and 300,000 brick burned last season. The first kiln we burned in three days, the second in two and three-quarter days, and the brick were first-class in color and hardness, and the fuel required to burn them did not cost over 30 cents per thousand (wood at $3.50 per cord) and that, too, in an old style kiln.

I have yet to find a brick burner that will credit the statement of burning brick in sixty-nine hours from the time the kiln was first lighted until the last wood was put in the arches. But as "truth is sometimes stranger than fiction" so it is in this case. Parties who may doubt the truth of the statement can, if they wish, direct a letter to the America Brick Company, America, N. Y., with stamp enclosed for reply, and learn the facts from William Bartlett and Nelson, proprietors. They are truthful and reliable men.

SAM. V. MEAD.

A Clay Deposit for Brick Manufacture.

Editor Clay-Worker:

I have a hundred acres of clay land and fifteen acres of it is within a half mile of the Delaware and Raritan canal and an equal distance of the Pennsylvania railroad depot at this place. The clay is a red shale clay, without any stone and scarcely any grit. It is more than 25 feet thick and is the same from top to bottom, and has two feet top soil over it. The land is rolling and drains itself. This place (Rocky Hill) is fifty miles from New York by the railroad and about sixty-five by water. The distance to Philadelphia is about the same. Excellent brick in every respect have been made from this clay, experimentally, and those made by the "dry process" by a manufacturer who has been particularly successful with that process, were especially satisfactory.

I am desirous of utilizing this clay but I have no practical knowledge of brickmaking. You may have among your subscribers some one looking for clay lands near New York, which I am informed is the best market in the country, and it might be of interest to them to know of this place. I shall be obliged if you can tell me whether the dry process of making brick requires a very special kind of clay, different from that used in the plastic method, and if a clay adapted to the dry process is more difficult to obtain than that suitable to the plastic method. I enclose you a little bit of the clay.

K. L. FLEMING.

Rocky Hill, N. J.

[It is claimed by some that the "dry process" requires a clay especially suited to this process, and that such clays are exceptional rather than common. It is probable, however, that the further developments of this process will discover the fact that clays suited to this method of manufacture are easily obtained and abundant. Plastic clays are abundant, but they differ in degrees of plasticity. It may be that ere long it will be determined that clays differing widely in many repects may be so manipulated as to be worked profitably by the "dry process." The field is open and promising. —ED.]

Philadelphia News.

Editor Clay-Worker:

The brickmakers have been agitating for an adjustment of wages on a higher basis, but have accepted, I believe, a continuation of last year's rates. The brick manufacturers have closed some of the largest brick contracts ever entered into in this locality and everybody is now down to hard work for the season. Our brick manufacturers all give a good account of the season. The telephones are busy. Contractors are rushing in and out, and up and down, the wagons are hauling brick out to the new work and everything looks driving. Mr. Dobbins in the Ledger Building, and Mr. Jorden, at 13 Market, are exceptionally busy. Down along Long Lane business is booming and the long stretch of open space between that avenue and the "neck" will be covered this summer with brick and mortar. Outside brickmakers calculate, they tell me, on selling more brick in Philadelphia than ever. The fine pressed brickmakers also are crowded and last week some of the best contracts of the season were placed. No discouragement is heard. The builders calculate on a big year. Already permits have been taken out for over 2,000 two and three-story houses. An eight-story cold storage warehouse is going up at once on the Delaware River front. This week the Reading Railroad terminal scheme goes through and that means not a few million brick for the roadwill be in all, three or four miles long and most of it brickwork. The Reading has been fighting the opposition railroad influence in councils for a year or two.

About all we can say here is, we are busy and expect to be busier. Our machinery makers are doing some big work for brickyards throughout the state and elsewhere.

Last season a great deal of brick was sold away down. This year there is a better feeling. While there is no combination, stronger prices will be realized. The same is true in lumber, cement, stone, slate, etc. The volume of business is larger in general trade and manufacturing circles. Railroad traffic and earnings are expanding. The demand for money has sent up the rate of interest a little, but a disbursement last week of forty million dollars has helped to ease the money markets. A Southern paper tells us that during the first quarter of the year 52 brickyards were started in the southern states. We have not started many in Pennsylvania but we have enlarged a good many and have at a fair estimate, increased our capacity by 10 to 15 per cent.

People talk about the rapidly growing West and the great energy evinced there. Why here in old sleepy Philadelphia we can give the West points. To begin with, we have run ourselves in debt over fifty-seven million dollars and that is something. It costs us about eighteen million dollars a year for water, light, protection and all the luxuries of modern civilization. Last year we gave the builders over thirty million dollars for houses to live in, shops to work in, churches to say our prayers in and banks to put the rest of our money in, and this year we have served notice on them that we want more bricks and mortar. Our gas last year cost us $3,321,962 besides $804,000 for public light, for all of which we got 3,200 million feet of gas at an average cost of $1.02 against an average cost of $1.40 two years ago.

Though this is not strictly clay or brick talk, it comes in. We laid forty miles of gas pipe and now have 917 miles of gas pipe in all, or enough to stretch from here to you. We drank and wasted and turned into steam and washed our faces with 37,000 million gallons which gave every man, woman and child 740 barrels of water apiece. It cost us $702,000. Our East Park reservoir holds, when full, 306 million gallons and covers 47 acres and 25 feet deep of water. Our distribution covers 21¼ square miles of area and we generally have 560,000,000 gallons on hand, or about 600 gallons per head of population. In addition to this we have about one thousand saloons, so we are all right. Last year we laid 25 miles of water pipe. During the year 326,958 square yards of granite, asphalt, vitrified brick and macadam pavement were laid. There were removed 306,722 loads of dirt from the streets, 500,000 loads of ashes and 88,660 loads of garbage. Last year we built 33 miles of sewers and now have in all, 332 miles. We will soon have two or three lines of ocean steamers stopping here. So we are all right, There is plenty of room to build. The surrounding country is pretty thickly dotted with mansions and palaces where we all go when we get rich. Don't call this an excuse of a letter. An Indianapolis man asked me the other day what sort of a sleepy town is Philadelphia, any way? I hope he will see some sort of an answer to his queston in the above.

ANON.

Brick Notes From Spokane Falls, W. T.

Editor Clay-Worker:

I am much pleased with the Clay-Worker, and enclose a year's subscription.

This is a city of about 15,000 inhabitants and a hustler, if there ever was one. I commenced making brick here in the summer of 1880. The town contained about 200 wild and woolly pioneers. I continued in the business up to last year when I sold out my interest in the largest brickyard north of California to my partner, Mr. H. Brook, builder and contractor. He in turn sold out to Messrs. Spear, Belt & Co., who run it at present. Its present capacity is about 7,000,000 per annum. There are two Martin machines run by steam. There were about 5,000,000 made on it last season. They also run a Perfection re-press last year. That part of the business was only a partial success. The clay on that yard is critical material to burn. If burned just enough it turns out a very fair color, and strong; if underdone they are tender and pale; if burned only a little too much they turn gray, so the boys did not hit it very well on the pressed brick, even if I did train them myself.

Spear, Belt & Co. put in a pottery kiln this fall for burning re-press brick, sewer pipe and fire brick. The clay for this use they get a few miles from the yard. They also talk of putting in pug mills, or crushers, and a semi-dry machine of some kind. They have plenty of capital. The little valley, about a mile from the city, where their yard is, was at one time a lake, and the material for brick is a deposit. The top is fine loam to a depth of two or three feet, then a hard pan for two feet or so, then a very fine clay—a light drab color—then granite sand, medium coarse, some stratas, however, fine enough for sanding moulds. Brick is made of the whole mixture as it comes, loam, clay and sand.

The next yard in size is that of N. Tripplet, about two miles from town. He made 1,250,000 last year. A brickmaker by the name of Kelsey run two water brick machines but only made 200,000. Then there was another yard that made 200,000 or 300,000 which was a failure altogether. I don't know their names. N. Tripplet runs a horse-power Quaker Machine, and makes good brick.

I over-worked myself which was the reason I sold out the big yard. I have been resting and rambling around for a year, and feel like myself again, and I must be of the "earth earthy." I can't keep out of the dirt. I am going to start a yard again next spring. I own 80 acres 1½ miles from town; the clay is very strong and has to be reduced by sand, of which there is abundance anywhere around here. The clay itself is formed from a soapstone which underlies it. When making brick here before, I stripped some of the clay off to the soapstone in the fall, and the action of the frost would reduce several inches of it to the purest kind of clay during the winter. There is any amount of this soapstone formation here. I don't know how deep it goes, but it goes to a great depth, I know. The big yard I spoke of has clay for about 50,000,000 of brick. I don't know how much I have here, but I am satisfied I have a great deal more.

There are mountains of fire and pottery clay around here, which I judge to be of good quality. Mr. Ramsey, who runs "The Pacific Pottery," turns out some very nice ware. There is a young man, not in the business, who is a fine artist in the way of artistic work, such as vases, statuary, &c. I don't know much about that business, but I did not consider it possible that such fine figures could be made out of clay as his work that I have seen on exhibition. He burns it at Ramsey's. There is another pottery here, but it is not doing anything. One establishment of the kind is enough for this place yet.

I will start my yard this spring on a small scale, but I hope to build it up to the top notch again. I intend in course of time to put in machinery to reduce the soapstone and put the profits, if any, in the most improved machinery. I will put in a re-press next year.

J. T. D.

New York News.

Editor Clay-Worker:

Both real estate and building are feeling the effects—not of a boom—but of a steady business increase which is founded on what people generally, and inventors, particularly, believe to be the sure future of New York City. Building has been in progress all through the winter, and now that spring is here, foundation digging has begun to a surprising extent and the prospects are that the building operations of the coming eight months will be tremendous. Auction sales of building lots have been numerous and a great mass of vacant ground has been purchased by investors and speculators. Of course the former wish to make their purchases income-bearing by putting up houses for renting and just as true is it that the latter are selling to builders who either rent or sell the houses which they erect.

Naturally enough with this condition of things, the brick business is moving along nicely. A well known-brickmaker tells me that from the present prospects there will be more building done up to July 1st than was ever done before in any first six months of any year in the history of the metropolis. Of course some of it will be speculative work, but this time the building will be done on real and not speculative values. Brick of good quality can only be purchased now at a price $1.00 a thousand in advance of the price this time last year and as navigation has been open since the first of March, the weather has been so mild and pleasant and building has progressed as though it were mid summer rather than spring, the supply at first hands is becoming very short and all the manufacturers are hoping to begin unusually early. The owners of the Pallet Yards at Haverstraw began to manufacture late in March, but the frost and snow brought about their overthrow. So it is not probable that any brick will be manufactured before the 18th or 20th of April.

Among the new buildings for which ground is being broken is that of the World which is to occupy space near the Brooklyn Bridge. It will be thirteen stories in height and will be of stone, backed with brick. Other enormous office buildings contemplated are those of the Union Trust Co. on Broadway, near Rector Street and on Broadway, near Bowling Green, which is to be 17 stories high. The Cotton Exchange is to erect a seven story fire proof building at Beaver and Pearl Streets, at a cost of $200,000 and the Century Club is to erect its new club house at 43d Street and 5th Avenue. A new church is about being erected at 117th Street and 8th Avenue, while another will be built at 5th Avenue and 127th Street. It will be of granite. The new brick hospitals are also shortly to go up—one St. Peters, in Brooklyn, the other, St. Josephs, in Yonkers. The New York Central will erect a one story brick and frame storage house on the Hudson shortly.

Three new brickyards are about being established at Fishkill, N. Y. When completed they will have a total capacity of about fifteen millions which will be increased to thirty millions within the next two years. The projectors are the Leahey Bros., a young man named Bohn, who was formerly in the employ of the Rose Brick Yards, and Dinan & Co.

The yard of Rodermond & Co., at Verplanks, which for two years had been prevented from running by the stukers, will start up in full headway shortly.

BRIC-A-BRAC.

A Pioneer Brickmaker's Varied Experience.

EditorClay-Worker:

It might be said that I was born in a brickyard and the event happened near the then *little town* of Cincinnati, Ohio, November 12, 1814. My father made and laid the first brick that ever went into a store in Cincinnati. It was a one story structure on the corner of Main and Columbia or 2nd Street. My father continued to carry on brickmaking and laying until I left his house in the fall of 1834, and came South. I have been engaged in the same line of business ever since on public and private work. I burned all the brick for the U. S. Arsenal at Little Rock, Ark., in 1839 and 1840, also did a great deal of other brick work there. I did a great deal of jobbing (making and laying brick) on the cotton and sugar plantations on the Mississippi River. I made and laid the brick of the State University of Mississippi in 1844 and 1845. I burned nearly all of the brick (near 35,000,000) that went into the great U. S. Custom House at New Orleans in 1850-51-52 and afterwards carried on the business in that city till 1856 when I came here to Florida and took charge of the Co's business which made and burned the brick for Fort Jefferson and *Tortugas Island* near our coast. This contract was for 65,000,000 hard, first class brick. I had burned 28,000,000 of them before the war. During the war I made brick and worked most of the time for companies engaged in the Confederate Government (as the secessionists called it) and since the war I have been running some of my patents at the North, which in some cases required that I should burn brick which I did in several places, all the way from Baltimore to Rochester, N. Y. So I have been about sixty-five years almost a constant *maker* and *burner* of brick in *all of its grades and phases*, in every kind of clay that a brick can be made of; burning with all kinds of fuel and in all sorts of kilns; getting up patent kilns and brick machines and putting them on the market. I got out a patent for improvement in kilns in 1858 and a patent for a brick machine in 1861. My machine was illustrated in the *Scientific American*, July 5th, 1861.

I published a *short Treatise* on Clays, Brickmaking and Burning and the Theory of Dry Press Brick which was in my circulars advertising my brick machine, and it went through two editions. I might have made money by revising and selling it as it was really the first theoretical treatise ever published on brick making and clays for brick. I believe I can say without fear of truthful contradiction, that no man is now living who has had such a long, varied experience in brickmaking and burning as myself. I have made and burned brick in over one hundred places, and have never found exactly the same kind of clay in any two of the places. We hear talk of *perfect brick* and *thorough brick burners*. No such thing, however, existed. Brickmaking, or I may say, clay-working, is the oldest art practiced by man and if I say it is in its infancy, perhaps you will laugh at my boldness. I can teach a boy to become a perfect bricklayer but I could never finish him up a perfect brickmaker.

Brickmaking and burning involves more versatility of talent, more subtilty and acumen than any other art practiced by man. I have learned far beyond all the teaching and practice. I have been in the business and am yet a student and not a *perfect* master of the art. I have found that clay is a mineral in some respects analagous to the metals. It can be made as porous as sand or it can be made brittle and hard or hard and tough; it can be made as dense and as strong as a good stone but unlike the metals, every kind of clay requires different treatment. I have an inexhaustible quality of clay on my land here from which I make fire brick and also a cream colored front brick of very peculiar beauty and excellence.

Clayworking is destined to be one of our greatest industries. Its importance will be appreciated as the art progresses, and as timber and metal go into disuse for building. J. W. CRARY, SR.

Remarks on Firemen.

Editor Clay-Worker:

It is generally conceded that the important part of brick manufacturing consists in their being properly burned. There are three things necessary to successful burning: First, to have an abundance of fuel on hand when the fires are first lighted. Second, a skillful burner to manage all the affairs and who knows what to do, how to do, and when to do, to secure success. And lastly is the matter of firemen.

There is a great difference between a fireman who understands his occupation and one who does not. I found this out in my travels among brickmakers burning kilns of brick on first trial. My firemen, as a rule, were selected from among what are termed on most yards, "burners," that is, men who assisted during the burn in wheeling, or carrying wood and building fires under the direction of a head burner or superintendent. These men usually have but little skill in brick burning; none in fact. They only labor to get the work done as directed and as to having any care or concern in the matter it is entirely out of the question. Now to change these men from handling wood to shoveling coal seems to make them entirely indifferent as to results.

I have found where I had new men to instruct in coal firing, and could find no others, to select a capable, willing man of some judgment, show him the importance of the trust and stimulate him to excel by an extra reward. Get your firemen to vie with each other as to which can raise the best heat with the least coal, keep the brightest and clearest flame, ash pit emptied, an abundance of fuel close at hand for immediate use, and then keep all coal and ashes separated and a clean standing place in front of furnaces and about the kiln.

I think there are times when employers are very much to blame for the negligence of their firemen by not paying them sufficient wages and the result is their parsimony acts as a boomerang by rebounding on their pocket books. An owner of a brickyard as a rule, who wants to employ firemen will pay them no more wages than to common day laborers. This is not only unwise but unjust. There are but two changes of hands and these divide the day into shifts of twelve hours each and more frequently prolong their duties through a day and a night, and even two days and a night without any relief. The better plan is to pay these men by the hour the same as the day laborers. This makes their pay a trifle more and at the same time is an incentive to the ambitious laborer for a place to earn more wages.

The owner or manager of a yard can save many times over the increased wages of a good fireman in the saving of fuel bills. I once burned a kiln of brick for a yard owner who demurred at paying over one dollar for a turn of over twelve hours. Among the firemen was one who had fired for two years on an ocean steamer. This man wanted $1.50 per day of twelve hours. I prevailed on the yard owner to employ him on trial. I found that he could fire the kiln for twenty-four hours and use no more fuel than any of the others would in twelve hours and he kept a good bright heat and everything in order as I have described. Here was a saving of not less than ten dollars per day in fuel with an extra outlay of fifty cents per day. The man was well worth two dollars per day as a fireman; he was vigilant, orderly and faithful. I would earnestly urge it upon brickmakers to give this matter more attention and secure the very best of firemen and then retain them at wages that will make it an object for them to remain with you. I very frequently have men make application to fire a turn or two at night during the burning of a kiln. I always explain to such men that firemen on a brick kiln have a steady job at firing and I do not intend to alternate the work from day's labor during the day to firing at night just to allow them to earn an extra turn or two. I want firemen just as I want wheelers, setters or any other class of workmen to follow that as their business. This applies particularly to yards that turn out a steady output of brick and are constantly burning their wares.

A fireman who goes on duty in the evening after doing a hard day's work, is in no condition to take charge of work so important as brick burning. He may have an idea that all he has to do is to open the door, heave in the coal and then wait till it is burnt up, and then repeat the process. This might be done, and ton after ton of valuable fuel burnt to cinders and the kiln would never rise above a cherry heat. The fireman who has this conception of the work will take a nap while the fire burns down and trusts to luck or Providence that some untoward accident or incident will waken him to make the next fire. He will quite likely feel cool and shiver enough to rouse himself to see if the fire is burning or he will find himself nodding and falling over, as he is tired and has seated himself on a wheelbarrow or pile of coal, or the watchman will sternly call him to attend to his duties.

When a fireman goes to work rested and refreshed and makes up his mind to do his duty by keeping at work, he will not get sleepy, no more so at night than in the daytime. There is always work enough to keep him busy. The trouble is to get men who will conscientiously perform the work at night as others do in the daytime. They take advantage of the darkness to quit and do nothing after the furnace is filled with coal until it is ready to charge it again. Give your firemen to understand that they are to remain on their feet and be constantly employed night as well as daytime and a move will have been made a long way toward better burning at less cost. H. BRIX.

Cave Canem.

Editor Clay-Worker:

As I read the communication of your "Yaller Dorg" correspondent it brought to mind and memory certain lines of the poet Coleridge. "As the devil took a walk one day

He saw a cottage with a double coach house,
A cottage of gentility.
And the devil did grin, for his darling sin
Is pride that apes humility."

And yet he calls himself a "yaller dorg"; hints at clay eating, and gives us a lot of chestnuts in regard to weathering clay. His views on machinery remind me of the man who was in favor of the Main law but "agin its enforcement." Let us hope that when he gets that latin lexicon he won't make a mistake and put up "*Ego Sum Stultus*" instead of *E Pluribus Unum*.

Not a "yaller dorg" "or big city brick factorist," but simply a self-respecting brick manufacturer, with a motherly pride in every honest man in the same business. A Subscriber.

A New Field for Clay-Workers.

Editor Clay-Worker:

The valley of "Big Sandy Creek," the head waters of which are in Columbiana county, near the village of Hanoverton, Ohio, and which meanders its course toward the Tuscarawas through several miles each of Columbiana, Carroll, Stark and Tuscarawas counties, emptying into the river, which gives the latter county its name, between Sandyville and Bolivar, is about thirty miles in length and varies in width from one-half mile to a couple of miles. Its soil is rich and its people energetic, intelligent and prosperous. Agriculture has been the chief employment of the inhabitants of this beautiful valley, together with the mechanical arts and mercantile establishments necessary to supply a community of farmers.

For more than half a century it has been known that there were valuable deposits of clay along this valley, and it is fully that long since there was a pottery established at Waynesburgh. It was a small affair, conducted upon primitive plans, but some really fine ware was produced. The small manufacturer, with poor machinery, could not compete with the larger, finely equipped works, and the enterprise was finally abandoned. Recent waking up of interest in clay business has extended hitherward, and the abundant supply of clay has led to the erecting of several works of fair size at Malvern, in Carroll county. Brick, for street paving, is, we are informed, to be the chief product, and we understand the enterprise is already a success.

Nature seems, however, to have concentrated her efforts in the way of depositing clays in this valley in the neighborhood of Waynesburgh, a beautiful village of a thousand people five miles west of Malvern, on the Tuscarawas branch of the Cleveland and Pittsburgh railroad. There are inexhaustible beds of hard or flint, plastic and slip clays of all grades, and coal, both abundant, of fine quality and cheap.

The climate is salubrious and living not high. Markets are near by for all manner of clay products, and transportation facilities by C. & P. R. R. and Pennsylvania Co's. system of roads good, and likely soon to be made better by the completion of the Cleveland, Canton and Southern railroad.

One of these beds, that on the Rinehart farm, is now being operated by Mr. H. L. Wilson, who is making an exceedingly fine quality of brick. This clay burns a bright red, a most beautiful color, and is fine grained and very easy to work. Clay of quality fit for "saggers" is mined within a mile or two of Waynesburgh, and the "slip" clay is said to be of excellent quality.

The owners of lands here are anxious to have persons skilled in clay-working come and prospect the neighborhood, and stand ready to offer most liberal terms to persons with capital. An "Improvement Committee" has been organized of which Mr. Chas. H. Jones is secretary, and they will be glad to correspond with parties interested, and personally escort those who may call upon them with a view to locating here.

PROSPECTING.

So Say We.

Editor Clay-Worker:

Enclosed please find one dollar, to renew my "sub." to Clay-Worker, and I want to say "Thank you" for the many good things you have given us the past year, and also to those who have so freely given us through your *our* paper the benefit of their experience.

I think our American cousins are ahead of us in that respect, if they get a good thing they want others to share the good. We clay-workers in Canada, are, as a rule, more selfish, or, perhaps, more indifferent as to what others are doing.

When I started brickmaking it was without any experience and a little money, in about two years I had a little experience and no money, but I never lost faith in the business, and I believe will make it a success yet, in a small way, of course. I hope the Clay-Worker may continue to grow and prosper for it is doing a good work. C. E. C.

Stroud, Canada.

THE IMPROVED CHAMPION BRICK MOLD SANDING MACHINE.

The attention of brickmakers is called to the new advertisement on the back page of the Clay-Worker of A. H. Newton & Bros., relating to their Improved Champion Brick Mold Sanding Machine. The manufacturers of this machine claim many material advantages, some of which are specified in the "ad." They were the first to place upon the market any practical mold sanding machine, and have supplied all demands from all sections of the country, and while their machines have met with the approval of brickmakers and with largely increased sales each successive season, and have been free from any serious fault of construction or operation, the manufacturers have kept an eye on the requirements of the trade and have met the same by constantly adding new features and improvements until they have produced a machine which is perfect in its operation. By an ingenious improvement of the feed they have avoided all possibility of the molds binding upon each other and at the same time have prevented the scraping and collecting of clay from one mold and depositing it on the adjacent mold which has been the cause of "lumping" the molds. Practical brickmakers will appreciate this improvement and the fact that it tends in such a material degree to producing a clean, uniform and smooth brick. The manufacturers also come out with a fair, manly notice to the public at large that their machines are covered by several patents having broad claims. These cover not only the feed-table as originally constructed, but broadly, the rotating cylender and a belt for keeping the molds in place while being sanded. Being the pioneers, and having judiciously secured patents for other improvements from time to time, it would seem that followers in the field and purchasers of machines subsequently patented should take the caution to indemnify themselves against prosecutions for infringment, as the user is just as liable as the manufacturer. In fact, in this day of patents and patented machines, it is quite customary for manufacturers to indemnify purchasers and users of their machines against damages accruing by reason of infringement.

THE CLAY-WORKER

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☞Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES furnished on application.

Correspondence on all subjects of interest to Clay Workers is solicited. Communications from practical men will always be welcome. Address all communications to

T. A. RANDALL & CO.,
14-16 S. Tenn. St., Indianapolis, Ind.

WE ARE OF THE EARTH EARTHY.

It is a pointed saying, "Sprung from the dust, we live upon her bosom and draw our vital supplies from her ample stores, and when 'life's fitful fever' has burned itself out, our ashes drift back to their original source." "We are of the earth earthy."

The clay-worker who all day long, and day after day delves in clay, thinks and thinks, and then strives to work out his thinks, following in this line year in and year out, realizes the truth of our head-lines. Success, however, is attainable in clay working along this line. The different characteristics of clays, the varied results to be had by combining two or more clays, the mixing, tempering, weathering, washing, drying, &c., &c., make the business an ever open field for thought and discoveries.

He that enters the clay-working field with little purpose to think and observe closely, concluding that clay is clay, the same as chalk is chalk, that a process adapted to one kind of clay is alike applicable to all, will, ere long, be thrust out a sadder, if not a wiser man.

It is true, however, that the best efforts will often fail for want of proper materials, and yet the materials used may be so similar in appearance and to the touch that experienced clay workers are unable to detect any difference except by practical tests. Every change of material in any way, is an experiment until the character of the clay or mixture of clays is determined by searching trials. The very fact of such varied characteristics found in clays the world over has made important discoveries and achievements possible in all ages.

Of late years important improvements have been made and the most experienced men in the clay business are quite ready to say that the end is not in sight; to the contrary, only a good beginning has been made. There is so much to be learned about clay, practically the field is boundless. New comers into this open industrial field need to enter with careful steps.

A LIBERAL COMPENSATION.

A correspondent of the Clay-Worker in answering the inquiry of another of our correspondents, did the thing up so well from a practical standpoint that the party making the inquiry enclosed a $20 bill in a letter of thanks to the former as a partial remuneration for the service rendered. It was a liberal thing to remember Mr. C. T. Saxe in this way, and it is an example that might in many instances be imitated. There are quite a number, comparatively speaking, who are manly enough to acknowledge benefits received, but very few who think of enclosing a $5, $10 or $20 bill as a token of appreciation.

But what about those who can hardly determine whether it will pay to pay $1.00 a year for a publication devoted to their business? A publication full of just such "practical suggestions" from experienced men, that it does seem that a "way-faring man though a fool" could not fail to be benefited a hundred times over in a year's time. Yet men will run their hands down into their pockets up to their elbows and ask "Will it pay?" And the answer they make to the inquiry is indicative of their success or want of success in business. If a man has not got the snap in him to want to know the practice and experience of others in the same line of business, there is little hope for that man in this world, to say the least that can be said of him.

NATURAL GAS IN INDIANA.

The Indiana gas field is the most marvelous phenomenon of the State. Other productive gas fields are in pent-up valleys, or on the border of mountain ranges, but here we have the largest known gas field occupying the center of a broad level plain with scarcely a hill within fifty miles of it. The field extends from N.E. to S.W., a distance of about 150 miles, with an average breadth of sixty miles, giving an area of 9,000 square miles. Within this territory there are points where borings to the Trenton rock gave only brine, and in a few instances a moderate flow of petroleum followed the drill.

The borings range from 850 feet to 1,000 feet deep, and the ultimate rock pressure is about 250 pounds to the square inch; and while the flow of gas in a given time varies very much in different borings, yet when the well is capped, and the ultimate pressure obtained, it is nearly uniform. The largest wells in Indiana discharge about 10,000,000 cubic feet per day, under the above pressure. In this field there are about 400 borings that may be regarded as paying wells, but the number is being constantly increased. There has been much gas wasted in this field, but the Legislature has recently adopted measures to prevent this.

In composition, the gas is substantially hydrogen, with a variable mixture of marsh gas (carbide of hydrogen) and sulphide of carbon. It burns with an intense heat, giving but an imperfect light. No wells have been in use in this field long enough to test the question of durability. A few wells have filled with brine, which shuts off the flow of gas, while in others the flow has constantly increased, but generally the discharge remains uniform.

A VISITOR FROM THE SOUTH.

A few days ago we had a pleasant call from Mr. H. M. Woolman of Hot Springs, Arkansas. He visits Indiana to inspect methods and machinery employed in brickmaking in this region, with a view of going into that business in his Southern home. He showed some specimens of very fine clay, found in the vicinity of Hot Springs, and one sample that rises to the dignity, and deserves the name of kaolin.

We were glad to learn that Arkansas is waking up to the importance of her mineral resources, her splendid climate and her agricultural and commercial possibilities. We hope to see, in the very near future, this state taking a front position among her Southern sisters, in this race for prosperity and prominence. Mr. Woolman manifested the energy, guarded by the needed caution, that will secure these ends.

Dame Fortune is smiling broadly upon all the varied industrial interests of this great nation and especially upon the clay working industries.

EDITORIAL NOTES and CLIPPINGS.

Whene'er you see a heavy gloom
O'erspread the merchant's face,
And deep, dark silence of the tomb
Reign all about his place
You'll ever find in such a case
That he is far from wise,
And has no chance to win the race:
He does not advertise.

Bennett, Neb., is to have a brick yard.

M. F. Wharton will start a brick yard at Troy, Ky.

Pope & Son will build a brick yard at Camden, Ark.

Dr. Hair will start a brick yard at Buena Vista, Ga.

Richie & Osborne will start a brick yard at Gonie, N. H.

A Pottery is to be started at Kittanning, Pa., to cost $30,000.

Nelson Mackey is preparing to start a large pottery at San Antonia, Tex.

Gold Bros. & Co. contemplate starting a brick yard at Gordonsville, Tenn.

H. C. Thornton has formed a company to start a brick yard at Midland, Ga.

M. Butler, of Austin, Tex., is building some new kilns—Morrison's patent.

A. W. Snider, of Mt. Pleasant, Fla., contemplates enlarging his brick yard.

The Fairchance Fire Brick Co., of Fayette Co., Pa, has been incorporated.

Jas. M. White, of Easton, Md., intends starting a brick yard at Choccolocco, Ala.

Finney & Stevens are to establish a large pressed brick factory at Iron City, Tenn.

J. N. Bynum has started a brick yard at Anderson, S. C., with daily capacity of 40,000.

The Pittsburgh brickmakers have accepted the wage scale of last season for this year.

Jno. T. Scott, of Bridgeport, has purchased the Riverside Brick Works at Rush Run, Ohio.

The Troy (N. H.) Brick Co., will enlarge their plant so as to double their present capacity.

Wm. M. Bender, a well-known brick and tile manufacturer of Albany, N. Y., died the 5th inst.

Thomas Bros. have started a brick yard at Turner's Falls, Mass., with daily capacity of 40,000. They expect to make five million this season having already booked orders for nearly four million to be shipped to Boston and other points. Wm. Eggleston, of Holyoke, is superintendent.

S. C. Moore and others have organized the Helena (Ark.) Brick & Mfg. Co. and will purchase machinery.

The Lynchburgh (Va.) Land Co. desire proposals for the manufacture of a million bricks on their land.

The capacity of the Penitentiary brick yards at Seattle, Wash. is to be doubled by additional machinery.

The Findlay, O., branch of the Hydraulic Press Brick Co. will, it is reported, double their present capacity.

The Webster City, Iowa, Brick & Tile Co., are enlarging their plant and building a Chicago Iron Clad Dryer.

The Knox County Paving, Building, Brick & Tile Co., of Galesburgh, Ill., has been incorporated; capital $65,000.

The West End Brick & Tile Co., Roanoke, Va., has been incorporated; A. L. Gorley, Pres., J. S. Simmons, Sec'y.

Jesse Edwards, of Newberg, Ore., has sold his tile factory to Jordan & Smith and will run a brick yard at Madison, Ga.

L. E. & E. Harland and C. Hahn have incorporated the Harland & Hahn Brick Co., Chicago, with capital stock $45,000.

The Georgia Terra Cotta Works, J. T. Ware, Sec'y, have secured thirty acres of clay land near Macon and will build a factory.

The Boone Tile & Brick Co., of Des Moines, Ia., has been incorporated by W. C. Shepard, Lydia C. Malon and Currence Shepard.

Frank McHard's Brick Works at Centralia, Wash., were burned recently. The fire started in the dry house which was entirely destroyed.

The King-Hill Brick & Mfg. Co., of St. Joseph, Mo., has been incorporated by Jas. C. Baldwin, Chas. H. Saunders and others. Capital stock $35,000.

Robert Holloway, is organizing a company with $25,000 capital to erect works for the manufacture of drain tile, sewer pipe, etc., at Clarksville, Tenn.

C. & A. Potts & Co. report trade good, especially in their Mold Sander, the demand the past six weeks being so great they had to put on an extra force of men to keep up with orders. They have shipped them to all parts of the country. Since last issue they have shipped four complete outfits of Brick Machinery and several Disintegrators.

Evens & Howard, the well-known Fire Brick & Sewer Pipe Mfrs., St. Louis, are suing the Missouri Pacific R. R. for $930 due them as rebate on freight.

The Columbia Brick Works, at Alexandria, Va., has been purchased by W.C. Morrison, of Washington, D.C., for $93,000. The plant includes 95 acres of land.

F. W. Farquar, of Ensley, Ala., contemplates engaging in brickmaking and desires catalogues of improved machinery and circulars giving information on the subject.

The Pueblo (Col.) Brick & Tile Co. are now making 50,000 brick a-day. They start under favorable auspices there being a large demand for brick at from $7 to $12 per thousand according to quality.

The Sewer Pipe interests of the Pacific coast are looking up. Clark's large works at Alameda, Cal., are in operation again with a reduced force. They also make fire brick for which there is a steady demand.

The Jeffrey Mfg. Co., of Columbus, Ohio, report a thriving business. The demand for their Elevating and Conveying Machinery continues unabated, while the same can be said of the other specialties which they manufacture.

The Hot Springs Brick & Tile Co. has been incorporated, capital $10,000, Ellis Woolman, Sec'y and Treas.; H. M. Woolman, Manager. A complete outfit for brickmaking has been purchased from Fletcher & Thomas, of Indianapolis.

The Alabama Brick Mfg. Co., of Choccolocco, close a notice in a local newspaper as follows: "Thanking our friends for past favors we solicit their further orders and continue making 30,000 a day, rain or shine, of the best brick made in the state."

Blackmer & Post, Sewer and Culvert Pipe manufacturers, of St. Louis, Mo., report an increase in sales thus far for 1889 of 150 per cent. over the corresponding period of last year. Their new works are running regularly, and it is announced that the old works on Summit Avenue, which have lain idle all winter, will start up soon.

Sauk Center, Minn., is considered an excellent site for the location of manufacturing establishments of various kinds and especially brick and tile works, potteries, etc. There are extensive clay banks near there which experiments prove are exceptionally rich in quality as well as quantity. It is surrounded by a fine timber country thus assuring cheap fuel and the market is large and growing rapidly.

George Carnell, of Philadelphia, who needs no introduction to the brickmakers of the U. S., having built for himself a favorable reputation as a manufacturer of brick presses has perfected his Steam Repress and now offers the trade a long felt want. The Peerless Brick Co., of Philadelphia has been running one of these presses for several months and speaks very highly of it. Those interested in this line should write to Mr. Carnell for descriptive circulars.

A. O. Jones, for many years a leading tilemaker at Columbus, O., has moved to Zanesville, O., where he has erected a model factory. The buildings are 64x130 feet, four stories. The clay is virtually unlimited and of excellent quality. For fuel they have coal which they mine themselves. With unusual shipping facilities both by rail and river they expect to do a large business. We hope they will and wish them abundant success.

Geo. W. Sharer reports a lively demand for his Improved Kilns and Dryers, cuts of which appear on pages 214 and 215 of this issue. A large number of these kilns and dryers have been in operation in the Eastern States for the past few seasons and as their good qualities are more fully known and acknowledged the demand for them increases. Mr. Sharer is an untiring worker and we are pleased to know that success attends him and hope his cup may be filled to overflowing.

The St. Louis Iron & Machine Works may well be called the *peers* among builders of dry clay brick presses. They have built all the Hydraulic presses now in use (and have just got a contract for another to furnish within 60 days) also have an agreement to build whatever presses the Eureka Brick Machine Mfg. Co. needs and last but not least build their own "Lion." They certainly have all the experience necessary to manufacture a perfect press and judging from the records, the "Lion" is a "Lion" indeed.

A former resident of our Hoosier state who is now visiting the brick yards of the South writes that the brick interests in that section are flourishing. A trip through Texas found the brickmakers at Houston, Beaumont, Austin, Waco, Fort Worth and Dallas prosperous and happy, and adds: "While in Mississippi I saw a kiln burned that would fool most of burners, for instead of settling the top of the kiln actually raises four or five inches. The expansion does not injure the brick, as some may think, which are strong and hard."

When a new chief magistrate has to be taken to the national Capital it usually falls to the lot of our great Pennsylvania Road to do the service. Its latest feat is the transportation of President Harrison from his home in Indianapolis to Washington City, a distance of 650 miles, in just twenty-two hours, without a delay, accident or annoyance of any sort. It is this sort of thing in which the Pennsylvania never fails that bears eloquent testimony to its efficient organization, equipment and management. It has done more than almost any other road to make long journeys, which were formerly a severe test of physical endurance, a positive, pleasure and even luxury.

It was our good fortune recently to visit the machine shops of A. M. & W. H. Wiles, at Grassy Point, New York, where the well-known Wiles' Brick Machine is made. These shops were established fifty or more years ago by the father of the present owners and have been in continuous operation meantime. They have been enlarged from year to year as their business increased till now equipped with improved machinery they are making an extensive line of brick machinery and brickmakers' supplies which they ship to all portions of the U. S. There is an air of industry and substantial worth about the premises that impresses one with the idea that their work is one of permanence and we predict that those who visit them fifty years hence will find the same name over the door and the work going on then as now, quietly, but surely. "So mote it be."

A recent visit to the shops of Chambers Bros. Co., near Philadelphia, found them busy as bees turning out Brick Machines, Clay Crushers, Brick Pallets, Etc. When we say busy as bees we do not wish to imply any unseemly hurrying or bustling, for that seldom, if ever, occurs in a well ordered shop and theirs is of that order, where every man is in his place, quietly, but industriously, performing his duties—all at work like one vast machine, running smoothly, without hitch or jar, which says as plain as words: "A master mind is in charge here." This firm has gained an enviable reputation as manufacturers of reliable machinery. It is their ambition to provide the strongest, most durable and perfect machinery and the constant and increasing demand for the Chambers' machine proves that the craft appreciates their efforts and are willing to pay a good price for a good machine. Their sales so far are far ahead of any former season and they consider the prospects good for a most prosperous year.

EDITORIAL BREVITIES.

Mix brains with your clay if you would succeed as a clay-worker.

"What I don't know," said an experienced clay-worker, "is all about clays." Some new beginners will know much more.

Men who are always finding fault with everybody and all things in the progress of the world, are back numbers of volumes long since covered with the dust of ages.

Machinery of all kinds will last longer, run better and occasion much less loss of time, if kept clean, the bolts and taps tight and all the bearings well oiled. Again we say keep well oiled.

"For want of a nail the shoe was lost; for want of a shoe the horse was lost; for want of a horse the rider was lost, &c." For the want of tightening a tap the machine was badly broken, causing the loss of much valuable time.

What doth it profit a man to save one dollar a year by not taking a publication devoted to his interest, containing the experience of hundreds of others engaged in a like business, and lose hundreds of dollars in not learning the best methods developed by the leading men of the craft?

BUSINESS ADVERTISING.

What is said to be the largest theatrical advertisement on record is that just placed by Mr. Henry Irving in the London Era. It occupies sixty columns, or twelve pages of that paper. It is a monument to Mr. Irving's enterprise as a theatrical manager, and is one manifestation of that business skill which has brought to him success in the department of pecuniary as well as artistic effort. In speaking of this matter the Boston Herald says: "The Napoleonic system in advertising has never failed to produce good results. When we use this adjective we, of course, assume that advertising is applied with judgment, rather than recklessly. There are the proper mediums for it, and there is the proper method of appealing to the public in what an advertisement embodies. No man has employed it in this way, on however large a scale, without realizing ample returns from the operation."

Some houses argue that "everybody knows them," and therefore they do not need advertising. "Everybody knows" Mr. Irving, but he has the good sense to realize that the way to keep a snowball growing is to roll it.—Ex.

NEW PUBLICATIONS.

The Official Report of the Third Annual Convention of the National Brick Manufacturers' Association, held at Memphis, Tenn., is out. It is both a neat and valuable publication, being a verbatim report of the discussions and papers read before the convention. It is especially valuable to those who were unable to attend the convention as by securing a copy they can read at their leisure the full proceedings. It also makes a valuable book of reference being in every respect a creditable publication. Price fifty cents. Address, T. A. Randall, Corresponding Secretary, Indianapolis, Ind.

Mr. Anthony Ittner, the well-known brick manufacturer, of St. Louis, Mo., has favored us with a copy of his catalogue of St. Louis Pressed, Molded and Ornamental Brick, which he manufactures in endless variety. A notable feature of the book is a cut of a large and beautiful mantel built of Mr. Ittner's brick, which takes the eye and gets prettier the longer one looks at it. A copy of the catalogue will be sent free on application.

We are indebted to the Royal Brick Co., Bridgeport, O., for a copy of their handsome catalogue of Molded and Ornamental Brick which is a work of art and should find a place on the desk of every architect and builder who appreciates fine brick and terra cotta.

The National Barrow and Truck Co., New York City, whose ad. appears on another page, have out a neat 8-page circular illustrating the various Trucks and Barrows made by them. Send for a copy.

Chandler & Taylor, Indianapolis, Ind., have issued a neatly Illustrated Catalogue of their Engines, Boilers, Saw Mills, Etc., Etc., a copy of which will be sent to any of our readers on application.

The Rome Brick Co., Rome, Ga., are out with a neat pocket catalogue showing

MENTION THE CLAY-WORKER.
When writing to Advertisers
MENTION THE CLAY-WORKER.

The Link Belt Machinery Co.,

New York, Minneapolis.
CHICAGO, ILL.,
11 to 23 South Jefferson St.
BURR & DODGE, Philadelphia.

MAKE

ENDLESS TROUGH CONVEYORS,

Adapted to handling (on incline) clay direct from clay-bank, or pit.

METALLIC APRON CONVEYORS,

(Sometimes called clay elevators). Adapted to feed Brick or Tile Machine.

TILE ELEVATORS, (New Pattern),

Will elevate any size up to 18-inch. Send for Prices.

LINK BELT ELEVATORS (using buckets),

Will elevate Semi-Dry or Pulverized clay.

We are prepared to contract for the entire machinery required for a Complete Brick or Tile Works of any capacity.

Send for 1888 Catalogue.

(Mention the Clay-Worker.)

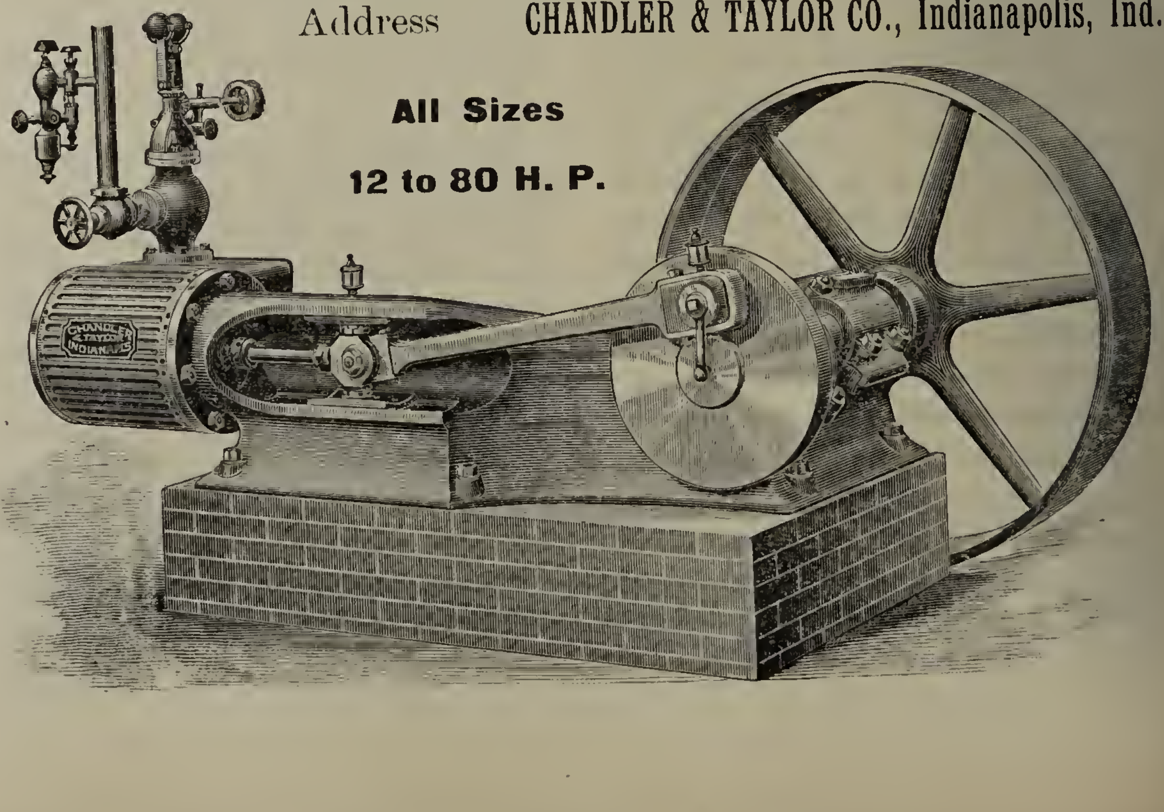
STRONG,
WELL BUILT,
SERVICEABLE.

STEAM ENGINES

IN STOCK FOR
QUICK
DELIVERY.

Every Engine Tested Under Full Load Before Shipment.

Address CHANDLER & TAYLOR CO., Indianapolis, Ind.



All Sizes
12 to 80 H. P.

Grant & Murray's Improved Brick Machine.

In placing this Improved Machine before the public and setting forth what we claim for the merit of the machine, we guarantee to fully verify in the practical operation of the machine.

This process of brickmaking has been thoroughly tested and has proven to be a perfect success, and is as cheap a process as any on the market. The machine is constructed wholly of iron and weighs upwards of twenty thousand (20,000) pounds. It is simple and durable. The operation of it is easily understood. Its capacity is two thousand (2.000) brick per hour. The brick are far superior in strength and finish to common brick. The clay is worked at a consistency that under pressure deposits the greatest amount of clay in the brick, giving them great strength and thereby making them especially adapted for street paving purposes. In actual tests where there has been the strongest competition there has not been a brick submitted that would stand near the pressure, absorb as little water, or stand the wear by friction as these brick.

If Brickmakers or those that are going into the business will send us a barrel of their clay we will fully demonstrate the quality of the brick in this respect.

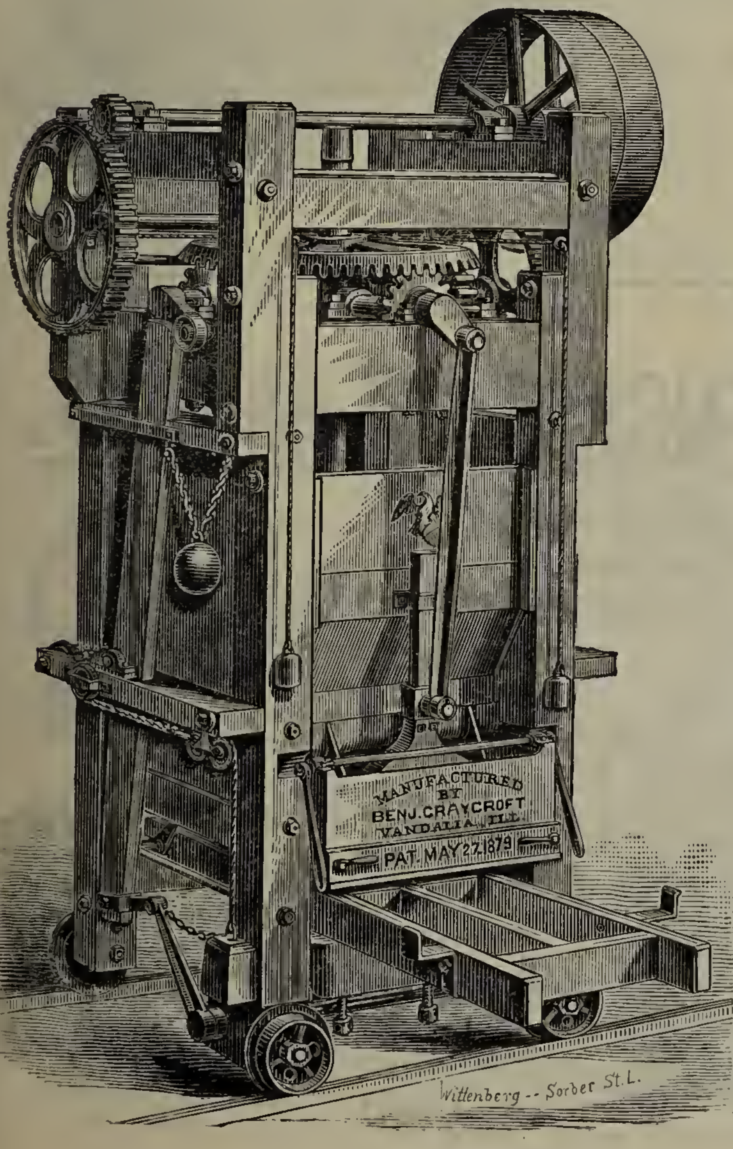
Not having sufficient capital we desire to dispose of an interest in the patent and business generally to some one, or company that would have sufficient capital to push the manufacture and sale of this machine as the merit of it would justify or demand.

We ask the attention of manufacturers desiring a specialty to the above, with a view to the manufacturing of the machines.

Machines can be furnished on short notice. Correspondence solicited. For further particulars, prices, etc., address

GRANT & MURRAY,
Middleport, Ohio.

[Mention the Clay-Worker].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EAGLE
BRICK
MACHINE
Steam and Horsepower.

THE BEST MACHINE IN THE MARKET.

The Horsepower Machine will make 17,000 to 20,000 brick per day; the Steam-power Machine, 25,000 to 30,000.

These Machines are sold on their merits, guaranteed to do first-class work.

Send for Circular.

BENJ. CRAYCROFT
Manufacturer,
Vandalia, Ills.

C. J. CRAYCROFT, Fresno C'y Cal., Gen'l Agt. for Pacific coast.

the many designs of Plain, Ornamental and Oil Pressed Brick manufactured by them.

Read the "For Sale, Wanted, etc.," columns for bargains, situations, experienced help, &c., &c.

NEW INVENTIONS.

The following is a list of patents appertaining to brick, tile, terra cotta, sewer pipe, pottery, etc., and the machinery used in their manufacture issued since our last number: (A copy of any of them can be obtained by sending 25 cents, the official price, to Chas. E. Brock, Patent Attorney, 925 F St. Washington, D. C.)

398,813. Brick Machine Attachment—P. G. Benson, Aurora, Ill.
399,064. Brick Mold — A. McKean, Brockley, Eng.
399,025. Clay Pulverizer, Etc.—J. Evans, Philadelphia, Pa.
398,919. Fire Clay Heater—G. W. White, Waco, Tex.
398,904. Pulverizing Machine—A. & D. Searles, Troy, Ill.
398,885. Tile Cutting Machine—C. A. Eissner, Saxony, Ger.
398,985. Brick Truck—J. G. Steele, Statesville, N. C.
399,275. Brick Drying Apparatus—G. B. Merrill, Lock Haven, Pa.
399,698. Brick Machine—R. F. Robinson, Kansas City, Kan.
390,651. Pipe Moulding Apparatus—A. C. Bruce, South Pittsburgh, Tenn.
400,076. Device for Holding Tile Settings—A. Greenaway, Louisville, Ky.
400,157. Dirt and Rock Crusher—G. E. Ames, San Francisco, Cal.
400,399. Cutting Table for Brick or Tile Machines—Freese (Plymouth, Ohio;) & Wolcott, Fremont, Ohio.

NEW ADVERTISEMENTS.

A. H. Newton & Bro.,
Brick Mold Sander.
Henry Martin,
Brick Machine.
C. W. Raymond & Co.,
Brick Presses, Etc.
C. & A. Potts & Co.,
Clay-Working Machinery.
Jonathan Creager's Sons,
Brick Machinery.
Wallace Mfg. Co.,
Brick and Tile Machinery.
J. W. Penfield & Son,
Clay-Working Machinery.
Chandler & Taylor,
Steam Enginns, Boilers, Etc.
A. Potts & Co.,
Brick Machinery.
Grant & Murray,
Brick Machine.
I. & M. Wolff & Coleman,
Iron Clad Dryers.
Chas. Kaestner & Co.,
Brick Presses.
Geo. W. Sharer,
Brick Dryers, Kilns, etc.
Small Ad's, For Sale, Wanted, Etc.

FOR SALE, WANTED, ETC.

Advertising rates in this column 20 cents a line, or 3 cents a word, each insertion. Seven words make a line. Cash should accompany the advertisement to insure insertion.

FOR SALE CHEAP. One Bennett Brick and Tile Machine. Address Wm. Breitmayer, Munith, Mich.
4 1 d.

WANTED. Position by an experienced hand, as burner or setter, at reasonable wages. Address A. E. Henry, (Box 955) Nebraska City, Neb.
2. 3. c.

CLAY GIVEN AWAY. Immense beds suitable for paving brick, pressed brick and fire brick. Address Jay Baker & Co., Streator, Ills.
3 4 c.

FOR SALE CHEAP. One Potts Cut-off Table and one Little Giant Repress. Both as good as new. Lewis W. Mead, Box 34, West Detroit, Mich.
4 1 d.

FOR SALE. One Frey, Sheckler & Hoover four roll clay crusher, a good and strong machine. Will sell cheap. Address Anthony Fries, Brookville, Ind.
4 3 d.

FOR SALE. One new Forty (40) inch latest improved Stedman Clay Pulverizer. For particulars address Sargent & VanZandt, Fort Worth, Texas.
1. tf. d

WANTED. By two brickmakers of experience, the contract to make brick by the thousand. Reference given. Address Oscar Suskind, 110 South Center St., Schnectady, N.Y.
3 2 c.

WANTED. A good second hand Penfield No. 7 Special Tile Machine. Address stating price, etc., to Anderson & Kenward, Roberts, Ills.
3 1 p 2.

FOR SALE. 1 horsepower Quaker Machine, only used about 2 months; in good order. We sell on account of using steampower. Will sell cheap. Amenia Brick Co., Amenia, N. Y.
3 2 c.

FOR SALE. One Simpson Brick Press used only three months. Two Boyd and one Chase Pulverizers, cheap. Standard Menomonie Brick Co., 309 Hennepin Ave., Minneapolis, Minn.
4 2 c.

FOR SALE. Having changed b. p. to steampower, I offer for sale very cheap a h. p. Quaker Brick Machine and one good brick press. A. Stolz, Meadville, Pa.
4 3 d.

WANTED. A first-class red brick burner one with experience in the successful burning of brick with crude oil. Address with full particulars, Spa Spring Brick Co., Woodbridge, New Jersey.
3 tf d.

WANTED. A position as foreman in sewer pipe or architectural terra cotta works, by a practical and reliable man, industrious and sober and fully competent to manage either of the above works. Address Sali-Silicate, Care of Clay-Worker.
4,2 c

FOR SALE. One Whittaker Semi-dry Brick Machine; one Stedman Pulverizer; one Bucket Elevator; all in good order, having made only about 600,000 brick. J. M. Harry & Co., Dallas, Texas.
2 6 5p.

WANTED. Situation as manager by a thoroughly practical man having experience in making, drying and burning of bricks by improved methods. Address Brix, Care of Clay-Worker.
3 2 c.

WANTED. A temperate, successful dry press brick burner. One that has had experience with the Eudaly Kiln and natural gas preferred. Address W. D. Richardson, North Baltimore, Ohio.
4 1 c.

FOR SALE. One Grand Automatic Pug Mill complete with two 36-in. pulleys, used only four months, almost new. For sale cheap. Address at once Wessels & Hirman, Jefferson Ave. and Cherokee Sts, St. Louis, Mo.
4 4 c.

FOR SALE. Three No. 10 Penfield Brick Machines, Crushers and Pug Mills, also ten thousand iron pallets; been used one season. Will sell half price of new ones. Apply to Lorillard Brick Works, Keyport, N. J.
4 2 d.

THE AERATED FUEL COMPANY'S SYSTEM.

[Patented in the U. S. and in Foreign Countries].

POTTERY, BRICK AND LIME BURNING BY PETROLEUM AIR BLAST.

The only Rival of Natural Gas. Cheaper than Coal or Wood.

A fire can be maintained indefinitely at a low heat, or increased to any required degree by merely turning a stop-cock.

OUR SYSTEM CAN BE ADAPTED TO KILNS NOW IN USE. No expensive plant needed. DO NOT CONFOUND THIS SYSTEM WITH ANY OF THE STEAM JET OIL BURNERS. The Insurance Companies approve our system. Nothing but air and Lima crude oil used in the fire.

W. S. COLLINS,
Sole Licensee for Middle Atlantic States,
171 Broadway, NEW YORK.

[Mention the Clay-Worker.]

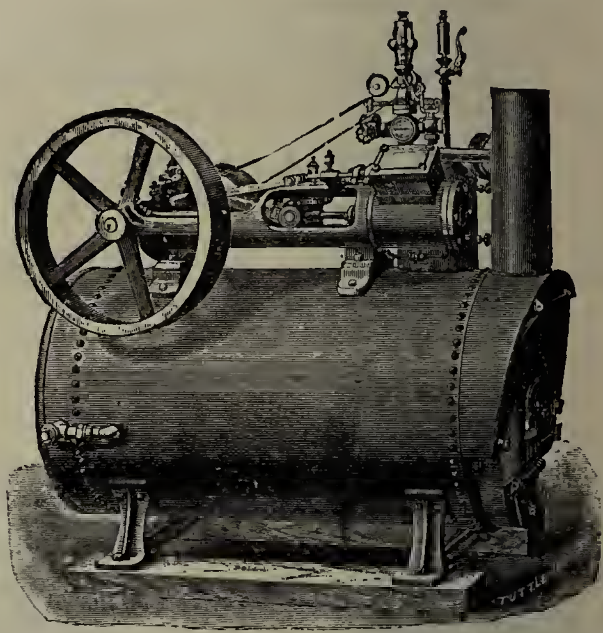
STEAM ENGINES!

Upright and Horizontal,

Stationary, Portable, and Semi-Portable.

All sizes, from Three to Twenty-six Horse-Power. Compact, Substantial, Economical and Easily managed. Guaranteed to Work Well and give the Full Power Claimed. Over 4,000 in Successful Operation. Not One Ever Exploded. No Engine Built so Well and so Low in Price. Illustrated Pamphlet Free. Address,

JAMES LEFFEL & CO.,
Springfield, Ohio,
Or No. 110 Liberty St., New York City.



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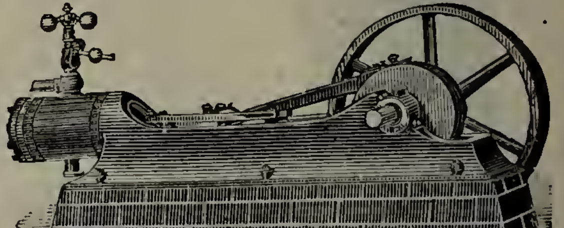

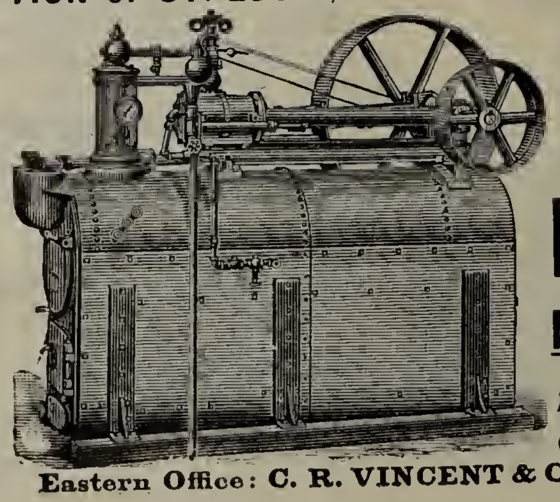

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MORE THAN 3200 IN USE.

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The National Barrow and Truck Co.,

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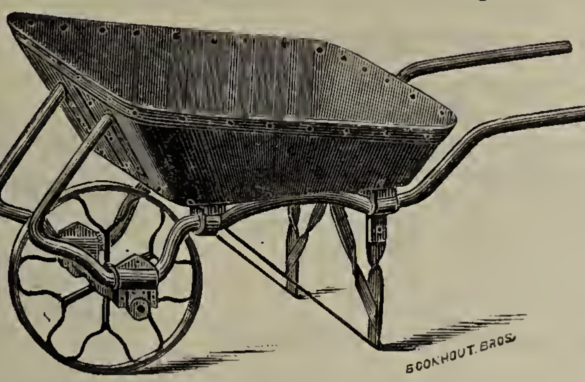
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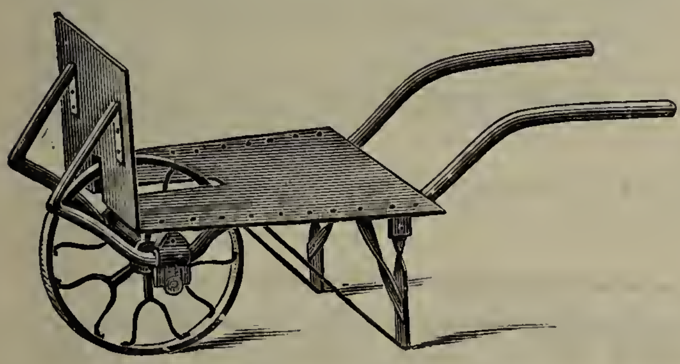
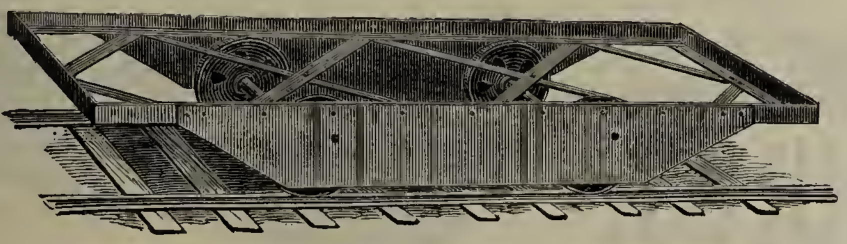
Manufacturers of Steel Wheel Barrows for handling Sand, Clay, Brick, Coal, Etc.

Also manufacturers of the Fitch Steel Pallets, Wrought Iron and Cast Iron Brick Drying Cars a specialty.

Our Barrows are used largely by the brick manufacturers in New Jersey and along the Hudson River. For our Drying Cars we refer to the Lorillard Brick Works, Keyport, N. J., and for our Pallets to Perth Amboy Terra Cotta Works, Perth Amboy, N. J. Send for illustrated catalogue and price-list.



BARROWS FOR GREEN BRICKS.



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AVERY'S SEAMLESS STEEL BUCKETS
FOR CLAY, ORE & ANY DAMP SUBSTANCE.
MANUFACTURED BY THE AVERY ELEVATOR BUCKET Co
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WE MAKE SEAMLESS STEEL BUCKETS FOR EVERY USE

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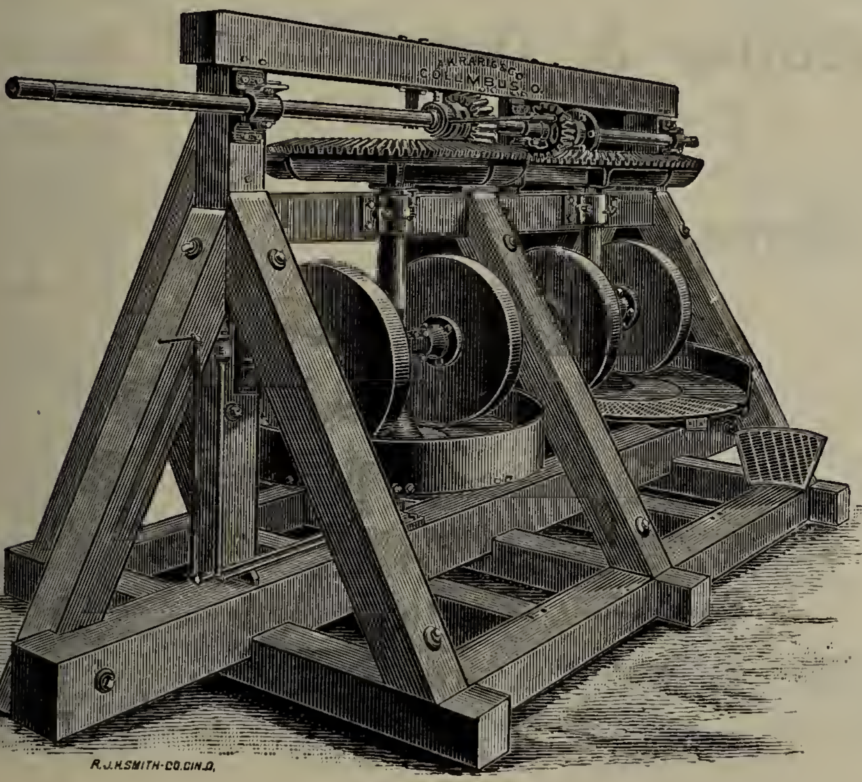
Founders, Machinists and Boiler Makers, Columbus, O.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Steam Sewer Pipe and Tile Presses, Grinding and Tempering Pans, Sewer Pipe, Tile and Fire Proof Dies, etc.; Automatic Cut-off and Slide Valve Engines, Boilers, Pulleys, Hangers and Shafting, Steam Pumps, Pipe Fittings and Architectural Iron Work.

FOR SALE. Full outfit dry press brick machinery. 75 h. p. engine, boilers, shafting, etc.; 2 Stedman Pulverizers, 2 heavy Andrus Presses, 1 new Simpson 4-Brick Press, elevators, cars, trucks, etc. For price and particulars address J. A. BOWMAN,
4 2 d. Kenyon Block, Minneapolis, Minn.

WANTED. By an experienced pipe or brickmaker, situation as working foreman. Acquainted with Vaughn and Barber machines. Economical handling of men and machinery. A fair knowledge of burning. Best of reference. Address W. A.,
3 1 1 p. Care Clay-Worker.

FOR SALE. One dry pan, one Chambers compound rolls, 17 spring trucks, two dump cars, and hoisting engine. The above was used but half a season; will sell for less than half cost. Apply to GEO. S. CRILLY,
4 1 d. Room 1, 176 Dearborn St., Chicago, Ills.

FOR SALE CHEAP. One 12 h. p. engine and boiler with pumps, etc., one Brewer-Tiffany Tile Machine; one set of smooth roll crushers, all in good repair. Will be sold cheap as we have no further use for them. B. F. TOWNSLEY,
4 1 c. Aledo, Ill.

FOR SALE. One Hoosier Auger Mill No. 5, in excellent condition, with dies for 3½ to 12 inches. My only reason for offering it for sale is that I wish to make larger tile than 12-inch. The outfit will be sold at a bargain. Address M. J. LEE,
2 tf d t j. Crawfordsville, Ind.

FOR SALE CHEAP. A first-class brickyard in the boom district of Alabama; good business, good location and machinery. Capacity 60,000 a day. Price, $10,000; one-third cash, balance one and two years. For particulars address T. M. D.,
4 1 c. Grand Hotel, Cincinnati, O.

FOR SALE. 4,000 to 5,000 pallets 33 inches long, 10½ in. wide, of one piece, surfaced ⅞ in. thick, with good pieces nailed on ends so they can be piled one on another. They are the finest I ever saw and cost me 11 cents each. Will sell the lot (all good ones) at 5 cents each. B. M. ALLISON.
4 1 d. Sec. Akron Fire Brick Co., Akron, O.

FOR SALE OR RENT. Brickyard near Richmond, Va. 21 acres, railroad switch to the kilns, abundance of best clay, new buildings, sheds, clamps, wheels, moulds, barrows, mules, carts, etc. For information, apply to JOHN C. GIBSON,
Richmond, Va.
4 6 c. or J. J. Gordon, P. O. Box 228, Cincinnati, O.

WANTED. A position as superintendent for the erection and management of brickworks; many years experience in all the practical departments of making, etc., by either the mud, plastic, or semi-dry processes thoroughly conversant with the best and most modern machinery dryers and kilns. Would have no objection to contract. FELIX,
3 tf. t. Care Clay-Worker.

FOR SALE. Two Pug Mills, one Chambers Compound Rolls, new, cost $1,200, will sell for $500; 9,000 Chambers Pallets, cost 70 cents, will sell for 25 cents, as good as new; 17 Drying Tunnels; 3 Transfer and 3 Dump Cars; large amount of belting, shafting and pulleys; all the above as good as new. Apply to C. E. EHLERT.
2. tf. d. Room 1, 167 Dearborn St., Chicago, Ills.

FOR SALE. A well located Tile Factory, Steam Power, with all modern improvements, having two lines of railroads with side tracks convenient for unloading coal or shipping—surrounded by a large area of rich prairie land, a large home demand for tile with no local competition. No better location to be found. One Wallace Clay Crusher in good repair and is a fair crusher. Price, $75.00.
For full particulars, terms, etc., address M. J. L.,
3. tf. d. Care Clay-Worker.

FOR RENT—OR WILL TAKE A PARTNER. Brick and tile plant. One of the most desirable locations on the Hudson River for a large business in drain tile, sewer pipe or brick, either or all combined. A tract of many acres of excellent clay for brick, tile or pottery; plenty of room; good dock and 1,800 feet front on river and siding on railroad. Good houses for men, both healthy and pleasant, and many other advantages. "C,"
2. tf. 3p. Roseton, Orange Co., N.Y.

WANTED. A thoroughly competent man who understands brickmaking and managing a brickyard, to take charge of a yard near Nashville, Tenn. The plant is complete and well equipped and ready for work. To the right party will sell a third interest in the plant on favorable terms or will employ a good foreman to manage same. Write for full particulars as to salary required and give references.
J. S. VALENTINE,
4 1 d. Nashville, Tenn.

[Continued on next page.]

FOR SALE OR RENT. Owing to other business engagements I will sell or lease on favorable terms, one Steam Brickyard of 2,000,000 capacity; also one Horse-power yard, 1,000,000 capacity, with machinery, tools sheds, and kilns complete in both yards, located on a river. near the fast-growing cities of Superior, Wis., and Duluth, Minn.; quality of brick good; clay supply unlimited; market unsurpassed in price and demand. A rare opportunity for a man with experience and some capital. No other should apply.
GEO. S. BROOKS,
2. 4. d. Superior, Wis.

WANTED. A sober, industrious, pushing man as foreman in a fire brick and retort works with a capacity of four million brick a year. Situated in one of the pleasantest and enterprising cities in the U. S. Must thoroughly understand the mixing, burning and manufacture of all kinds of fire brick, tile, shape work and retorts, etc. To the man possessing the above qualifications, this is an excellent opening. Address, stating qualifications, experience and salary to
F. B. W.,
4 1 d. Care Clay-Worker, Indianapolis, Ind.

FOR SALE. 1 Centennial Tile and Brick Machine. Dies to 12 inch; 18-in. can be added. Brick die, tables and Osman carriers; only used sixty days. Will sell regardless of cost.

1 Penfield Auger Mill, dies to 12-in., good condition.
1 Large Clay Crusher.
1 Brewer Tile Machine, good as new; dies to 12-inch. tables complete.
1 Hockett steam geared mill.
1 horsepower tile mill.
1 twelve horsepower engine on wheels.
1 Clay Crusher. A. BROWN, JR.,
4 tf d. Portland, Ind.

WANTED. Practical and competent man with some capital to lease or operate on shares, brick plant situated between Duluth and St. Paul and Minneapolis. Market for all brick that can be made at profit of from $2 to $5 per M. Present owners not practical brickmakers and desire some man with money who is to take control. Liberal terms will be made. Permanent kiln capacity 1,500,000. Inexhaustible bed of fine red clay. Wood $1.00 per cord; coal $3.50 per ton. Kilns all fitted for oil burning. Machinery all in fine order. Railway into yard. Everything complete. Thorough investigation invited. For further particulars address C. P. HAZELTINE,
4 2 d. 222 Nicollet Ave.,
or E. A. Gooding, 635 Temple Court, Minneapolis, M.

THE MONTSERRAT MINING AND MANUFACTURING COMPANY owns 2000 acres of valuable mining lands in Johnson Co. Mo., on the main line of the Missouri Pacific Railway 70 miles east of Kansas City and 20 miles west of Sedalia. These lands are underlaid with nine veins of coal and ten beds of clay each from 5 to 20 feet thick.

It is the most remarkable deposit of clay in the United States, including the most refractory fire clays as well as the finest quality of potters' clays and a bed of white sand which is a mixture of free silica and free alumina. At the bottom of the coal measures is a thick bed of black carbonate ore 46.20 per cent. iron, free from sulphur and phosphorus.

This Company has been mining the coal, clay and ore for years on an extensive scale and the property has been thoroughly explored. The Company has erected a large plant on the property for the manufacture of brick, tile and terra cotta lumber.

An experienced and competent man is wanted to superintend the brick work. A suitable man who will put in some of his own money to show his faith can get a splendid deal from this Company.

The superior quality of vitrified Fire Clay Paving Brick made by this Company has gained such a reputation there is no limit to the demand for them.

Address Montserrat Mining and Mfg. Co.,
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STANDARD EIGHT-FOOT DRY GRINDING PAN

For Fire Clay, Red Brick Clay, Limestone and Lime, Sand and Other Refractory Materials.

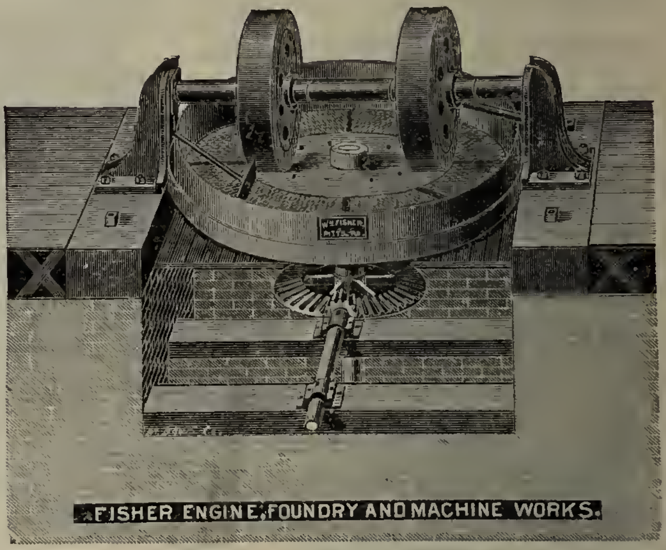
DESCRIPTION.

This Pan is undergeared and will grind Fire or Red Clay for 20,000 brick in ten hours.

The Rolls weigh 5,000 lbs. each.

We make this Pan in different sizes, from 5 feet to 9 feet in diameter.

We also make them with iron frames and or wood frames for overhead gear.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WE ALSO MANUFACTURE

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—MANUFACTURERS OF ALL KINDS AND SHAPES OF—

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We manufacture the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

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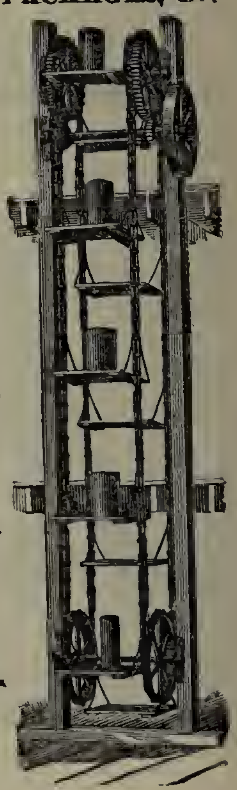
ELEVATORS FOR TILE, BRICK, PACKAGES, &c.



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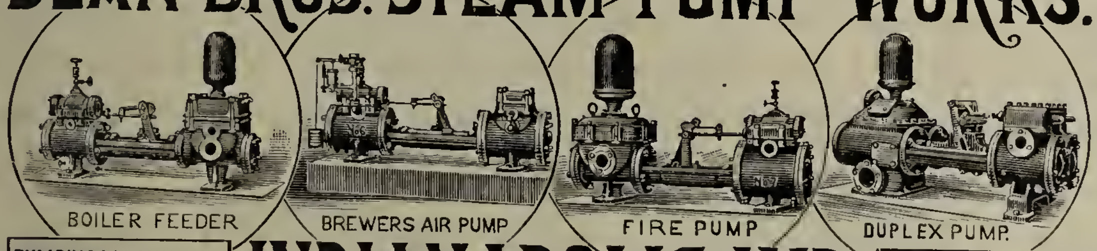

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INDIANAPOLIS, IND.

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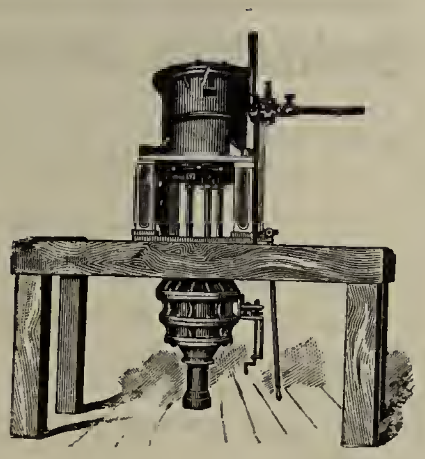
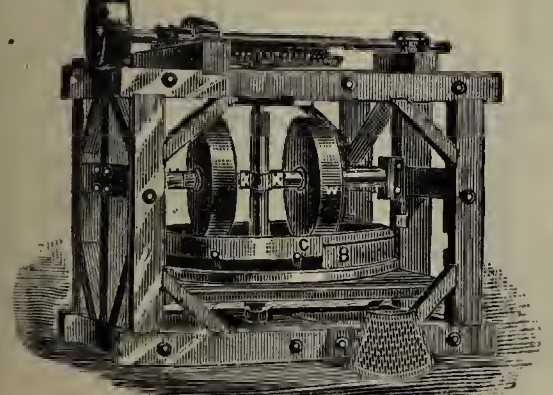
MANUFACTURERS OF

Steam Sewer Pipe Presses,
Dry Pans For Grinding Clay,
Wet Pans for Tempering Clay,
Pug Mills and Engines,
and All Kinds of



Brick & Terra Cotta Machinery.



Parties going into the Sewer Pipe Business will do well to correspond with us in regard to Machinery, as we manufacture COMPLETE OUTFITS FOR SEWER PIPE AND FIRE BRICK WORKS.

Write for Circulars.

STEVENSON & CO.,
Wellsville, Ohio.

COLORIFIC.

For coloring Brick, Mortar and all Clay Products a deep and permanent red. Most, if not all, colors in the market are artificially prepared. Colorific is a natural color. References and directions furnished for use. Sample free. Ask for price of

WESTBROOK & WELLS,
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4 6 d.

BRICK MOULDING SAND.

We are the diggers and shippers of the Centerton Brick Sand, which is the best brick sand ever discovered. It burns a *cherry red color*; it is very regular in quality. *It does not ball up, or stick in the mold.* Will furnish sample in natural state and burned to show color. Send for prices. We also supply Sand, Riddles, Spades, Shovels and other supplies for brick works.

INDIANA SAND CO.,
Indianapolis, Indiana.

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DEALER IN

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Complete equipments for brick yards furnished and put into operation.

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—FOR—

Brick and Tilemakers.

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A SPECIALTY.

☞Write for samples and prices.

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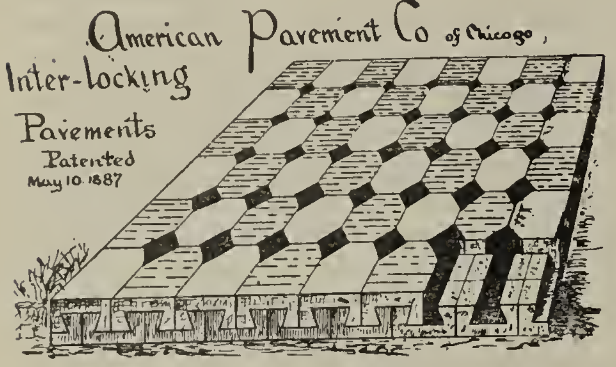
14 & 16 S. Tennessee St.,

INDIANAPOLIS, - - INDIANA.

New Article of Manufacture for Clay Workers.



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A HANDSOME ILLUSTRATED CIRCULAR FREE TO BRICK AND TILE MAKERS.

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SEE THE BATTLE OF ATLANTA.

Market St. Between Ills. St. and State House, Indianapolis.

Clay Excavated by the Marion Steam Shovel Co's shovels makes a 10 per cent. better brick and in some qualities of clay 25 per cent. better brick. All this by the thorough mixing of the different stratas of clay, which can be accomplished only by use of Steam Shovels. 25 per cent saving over and above hand labor. These points are worthy of your careful consideration. Are they not, Brickmakers? Shovels sold subject to a test of their merits in your own clay pit; and if we cannot prove as above represented, shovel is not yours. Prices low, terms easy. We do not recommend the using of Steam Shovel service in yards making less than 50,000 brick per day.

Address for any further information,

THE MARION STEAM SHOVEL CO., Marion, O.

Boehncke & Rohwer's Patent Continuous Brick Kiln.

CONTINUOUS KILN CO.,
1110 Farnum Street,
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Patentees for the U. S.

80 per cent. of fuel saved

A perfect result from any refuse fuel.

No loss in burning.

All goods uniform in color and quality.

Bricks burnt in summer and winter.

Construction of the kiln very cheap.

C. F. GOODMAN, Pres. and Treas.
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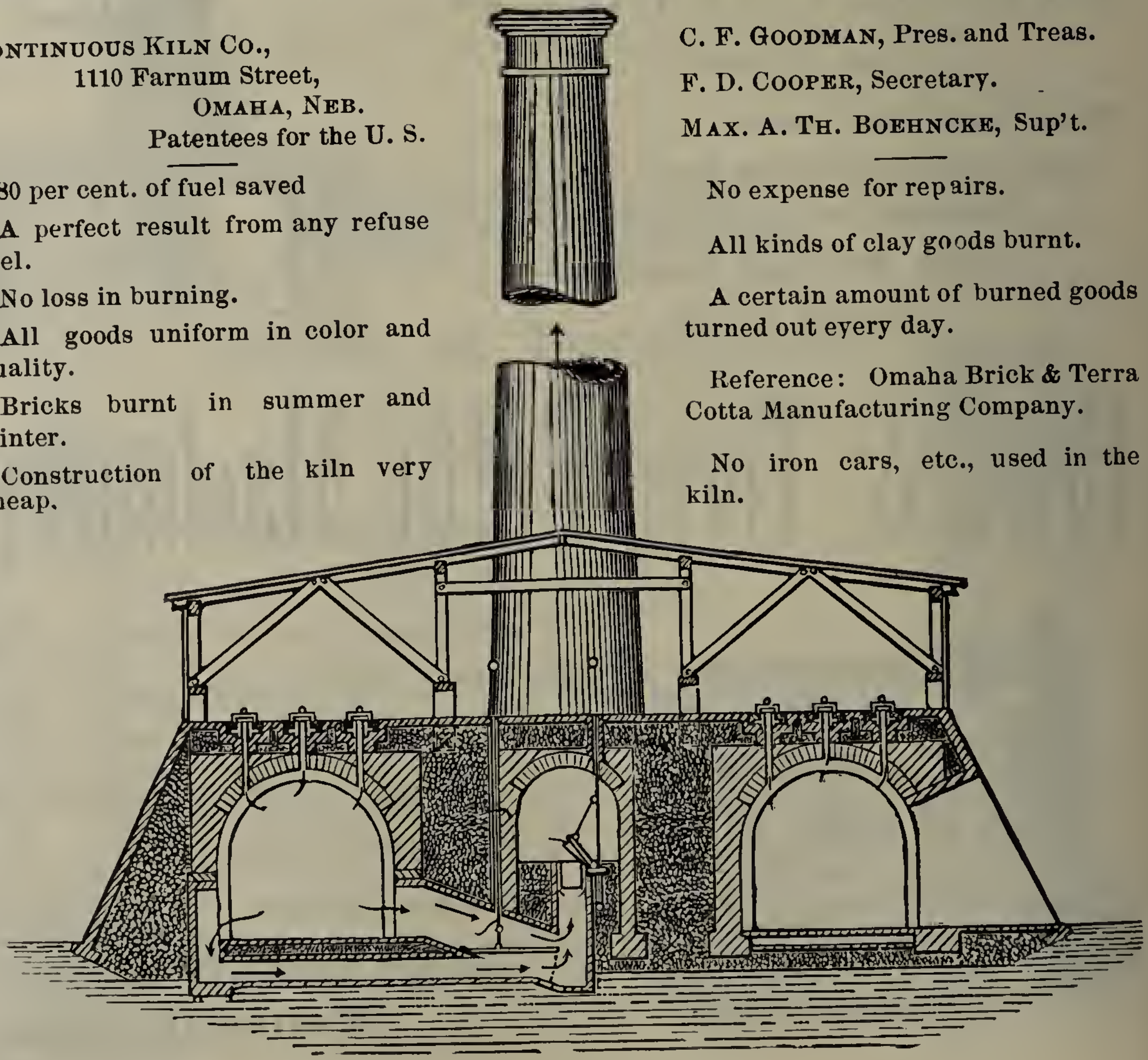
No expense for repairs.

All kinds of clay goods burnt.

A certain amount of burned goods turned out every day.

Reference: Omaha Brick & Terra Cotta Manufacturing Company.

No iron cars, etc., used in the kiln.



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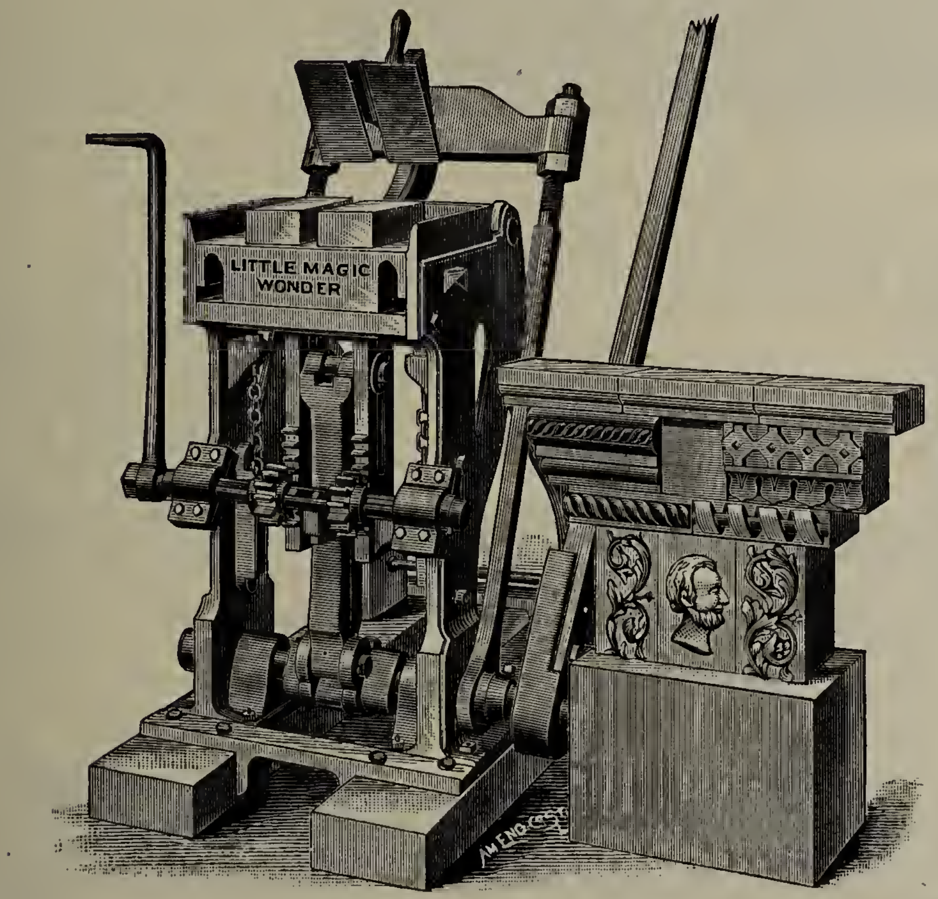

Hear What a Prominent Brickmaker Says:

St. Louis, Feb. 3d, 1889.

Mr. Wm. Thaison, Austin, Texas:

DEAR SIR—At the end of a fair and satisfactory trial of your Little Magic Wonder Dry Clay Hand Brick Press, it affords me great pleasure to testify to its efficiency for the purpose intended. I had long been looking for just such a Press, whereon at short notice and at very slight expense we could, within a few hours' time get out small orders for ornamental bricks of special designs and patterns without interfering with the operation and working of our regular machines. The great value of your Hand Press to me, lies in the fact that we can make bricks upon it by pressure on edge as well as flat wise, thus enabling one to make almost any conceivable design of fancy moulded ornamental bricks. As you let your machines go out on trial there can come no loss to parties intending to purchase. Very Respectfully, ANTHONY ITTNER.

Mr. Ittner runs two of these machines. His reputation as a gentleman and an expert brickmaker is so well and favorably known to the readers of the Clay-Worker that further comment is unnecessary.

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Of all shapes and sizes for Sewer Pipe, Stoneware and Tile Kilns. Also ground Fire Clay for mortar. Having made the special shapes necessary for this work a study we have mainly intended to lessen the masons labor and at the same time produce a better construction of the work. Address

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The first introduction into this country. A saving of 70 per cent. in fuel as well as less labor firing or attending. This class of kilns is more economical than the Hoffman or other continuous kilns on the Hoffman principle. Particulars of conditons on which plans, etc., will be furnished on application to

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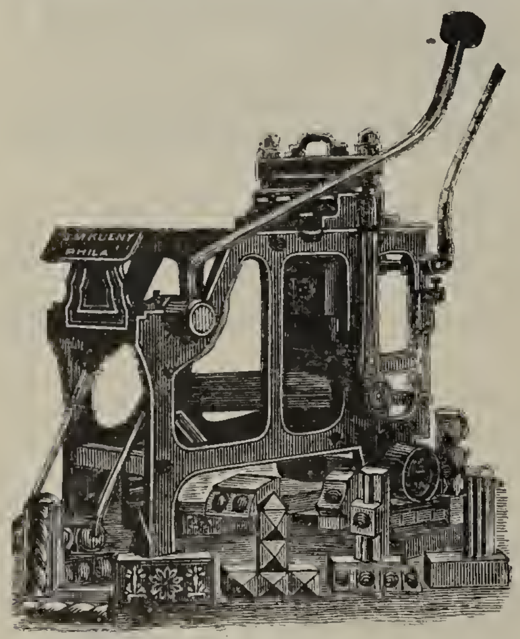

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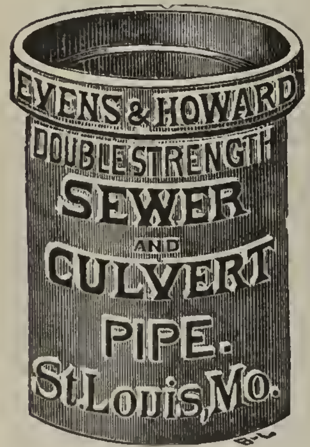

Culvert Pipe,

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SEWER PIPE,

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Write or testimonials. See our circular: 'Culvert Pipe Its Uses and Advantages."

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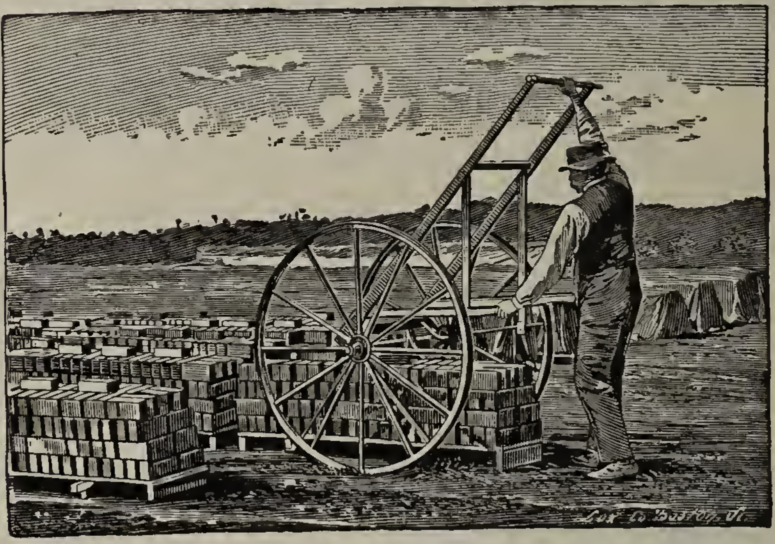
916 Market St., **ST. LOUIS, MO.**

Manufacturers of Fire Brick and all kinds of Fire Clay Goods. Send us your orders if you want them filled promptly.

Economy Portable Brick Hake.

Patented Sept. 22, 1885, Re-issued Feb. 23, 1886. By
M. WALKER and E. MINER, Yankton, Dakota.



We desire to call the attention of all brickmakers to our PORTABLE BRICK HAKE, which certainly furnishes the cheapest and best means of handling brick from the machine to the yard, and from the yard to the kiln ever yet made use of. By this device the brick when taken from the machine are placed directly upon the haking boards, and when filled the haking boards are taken up by the truck and conveyed to the yard, where they are set down in rows end to end, where they remain until dry, when the truck comes again, picks up the hake of brick and takes it to the kiln. Thus one man does the work of four and the bricks go into the kiln in much better shape by not being handled while they are soft. We have a truck made especially for handling soft molded bricks on pallets. Yard County and State rights for sale. Please address for circulars and for further information,

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Or either of the undersigned, patentees,
M. WALKER, or E. MINER, Yankton Dakota.

KELLS & SON'S IMPROVED
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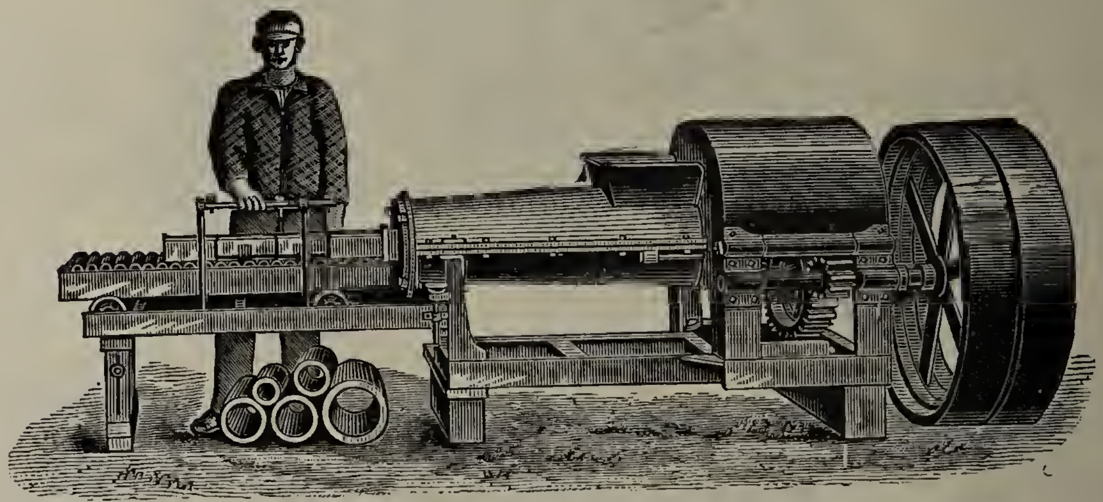

P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of Brick and different sizes of Tile by changing dies. For strength and durability we except none. We chalenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22, 1880; and February 12, 1884. We can furnish Crushers and also Trucks.

We can produce side cut Brick with our down cut-off, and make perfect edges and corners without the use of water or oil.

We have had Twenty-two Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 8 inches up to 18 inches and on our No. 2 Machine we can make tile from 2½ up to 12 inches.

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—FOR—

Tile and Brick Yards.

For handling Coal, Sand, Clay, Grain, Tan-Bark, Cinders, Ores, Sawdust, Lime, Cement, Shavings, Cotton-Seed, etc.

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Borden, Selleck & Co., Chicago. GENTLEMEN—We have used the Harrison Conveyor for the past two years. It takes about 90 tons of clay per day from our dry pan and distributes it through our cellar. Gives good satisfaction. Yours Truly, IOWA PIPE & TILE CO.

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Send for illustrated catalogue. **48 & 50 Lake Street, CHICAGO.**

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PIKE & SCHOPP, INVENTORS.

It Heads the Procession!

The "New Discovery" is a round down draft kiln with no grates, furnace doors, sub-arches or dampers, except at the stack, bound with iron bands, securely fastend to an arched irn door frame. This kiln is the result of years of experience by practical and successful tile and brickmakers, at a cost of thousands of dollars.

It is a conceded fact that perfect drafts and perfect combustion are indispensable to a perfect kiln. *Such* is the "New Discovery." This kiln is adapted for burning almost anything made from clay; can be constructed for either wood or coal and burn evenly throughout; is easily managed—will save in fuel, time of burning, wages of the burner, use of the kiln—nearly one-half.

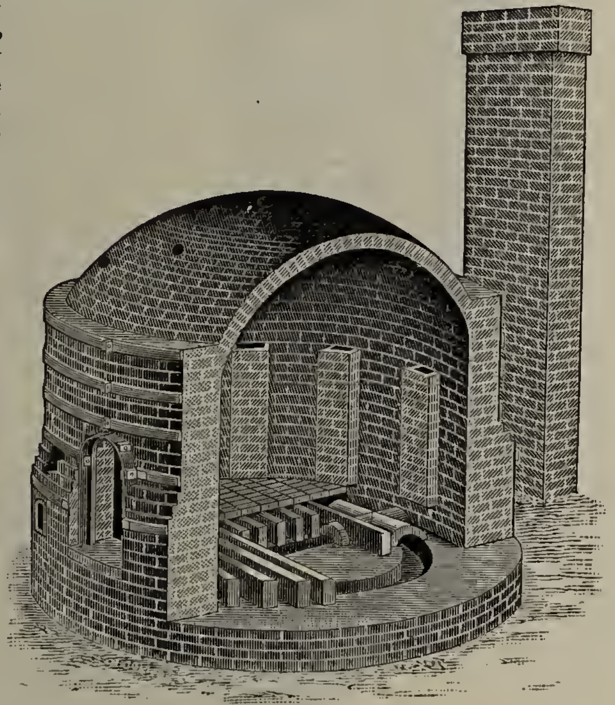
The proprietors of this invention propose to sell kiln yard or territorial rights reasonably and guarantee it to be the best kiln the purchaser ever saw or used.

Everybody is cordially invited to visit our works, where a kiln is, almost, in constant operation. We also have an arched iron door frame which is indispensable to a perfect kiln.

Send for circulars and testimonials.

We shall protect our patents from infringements.

Reliable resident agents wanted. Address—



PIKE & CASTLE, Chenoa, Ills.

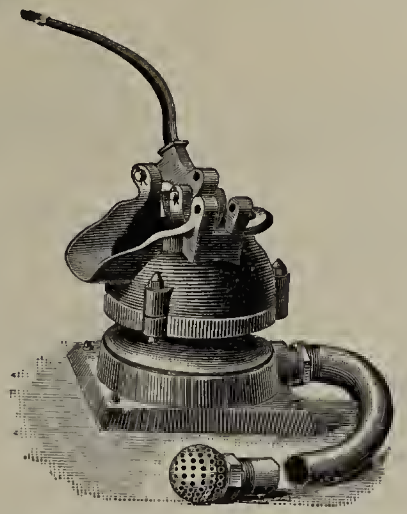
3000 TO 4500

Gallons of Water (per hour.)

BY HAND-POWER.

Pumps, Hand-Power Pumps

(LOUD'S PATENT.)



These pumps are simple, durable and low-priced.

A large capacity and easy working pump for **Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries,** or wherever it is desired to raise a *large quantity* of water by *Hand-power.* The pump has large valves (*accessible by hand*) and will pump water containing *sand, gravel, mud, sewage matter, etc.,* without *choking* or any *perceptible wear.*

Send for circular and price-list. Manufactured by

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TORRINGTON, CONNECTICUT.

THE PRINCIPAL AND BEST ROUTE
TO THE WEST IS

The Vandalia Line,

And the reason for it being is apparent to all those who travel between the East and the West. Its trains run solid from Indianapolis to St. Louis, and the service is conceded to be unequalled Comfortable day coaches, that are kept tidy and clean, handsome and elegantly furnished parlor cars with easy sofa chairs go to make the trip from Indianapolis to St. Louis a pleasure rather than a hardship. Pullman sleeping cars are run on day and night trains, a local sleeper is also run for the convenience of local travel between Indianapolis and St. Louis, and passengers can get into the car at or near the Union Station any time after 8:30 P. M., and will not be disturbed until St. Louis is reached at 7:00 A. M. Rates are always as low as by less important routes. Through express trains run as follows: Leave Indianapolis 7:30 A.M., 11:55 A. M., 11:00 P. M. Arrive St. Louis, 5:00 P. M., 7:30 P. M. and 7:00 A. M., respectively.

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FAST THROUGH TRAINS
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Arrive	From East	1.00 p.m.	*10.40 p m.	
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All trains have the finest of Buffet Sleepers and Reclining Chair Cars. For tickets and full information, apply to Geo. Butler, Gen'l Agent, 42 and 44 Jackson Place, opposite main entrance Union Station, the Union Station, Indianapolis, or to any Agent on the line.

Look in local column for special notices of excursions, reduced rates, etc.

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WILLIAMS' Revolving Clay Screens.
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P.L. SWORD & SON.
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THE
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BRICK MACHINE
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SWORD & SON SOLE MANUFACTURERS CLEVELAND OHIO U.S.A.

THE Jos. J. Kulage Press Brick Machines

Patented 1884, 1886, 1888.

Yield DOUBLE the Pressure of any other Brick Press (excepting the "Hydraulic") and are marvels of perfection.

A NEW ERA IN MAKING PRESS BRICK.

EVERY BRICK MANUFACTURER who intends or is making "Dry" or "Semi-Dry" Pressed Brick neglects his interests, if he fails to visit or correspond with the undersigned in regards to his system and machines. Works in operation day and night, all year (excepting December and January). Capacity: Daily 140,000 Bricks.

Our Fancy, Front and Stock Bricks are the only DRY-PRESSED Bricks made in the United States that are equal and SUPERIOR to those of the St. Louis "Hydraulic". We want a reliable Representative for the sale of our bricks in every large city.

JOS. J. KULAGE, President
College Hill Press Brick Works,
WORKS, near O'Fallon Park St. Louis, Mo.
OFFICE, 1435 College Avenue, ST. LOUIS.

TO THE CLAY WORKING TRADE.

GENTLEMEN:—Being disappointed in getting our cuts of the Little Wonder in its new dress for this issue we have decided as we had furnished you in the last issue a letter from the Little Wonder, we would furnish you a letter which is unsolicited and one out of many complimentary letters we receive regarding the Little Wonder.

Pleass read and meditate.

* * *

Office of
GEORGE HINCHLIFF,
159 La Salle St.
Room 3.

CHICAGO, April 4th, 1889.

Dear Sirs:-- I made 32,000 brick yesterday--8 hours--on your machine. I figure that I would have been $9,000 better off if I had had your machine two years sooner instead of the -------- machine.

Yours,

Geo. Hinchliff,

* * *

You can plainly see by the above that you cannot afford to use any other machine than the Little or Big Wonder.

For full particulars regarding them and a full line of the latest improved clay working machinery write to

THE WALLACE MFG. CO.,

[Mention the Clay-Worker.]

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Tables of Analyses of Clays, Etc.

howing the composition of all the principa clays in Europe and America, a book for all interested in clays and their products. Compiled and arranged by Alfred Crossley. Price, One Dollar. Postage Paid.

Extracts from the Author's Preface—Every clay owner should know all about his clay if is of any value, and one the first steps to a full and correct knowledge of clay is to have it subjected to a chemical analysis. But it is not enough for a man to know his own clay, he should also acquaint himself with the properties of other clays. and in fact, by his very knowledge of others he will be the better able to judge of the value or otherwise of his own. This little book is intended in an humble way to supply that knowledge. In it will be found the analyses of the best known and most celebrated clays of the Old and New World, with many others of lesser note but in some cases, of equal quality. * * * To each analysis, as far as known, I have appended a remark as to the character of the goods actually made from it. This, I apprehend may be useful as affording a clue to what line of manufactures other clays of like character may be very properly applied. * * * To make the book more useful to the practical man, I have added some blank space at the end, ruled and headed, so that parties can fill in the analysis of their own clay and any others in which they may be interested.

Sent post paid, on receipt of price by the publishers

T. A. Randall & Co.,
Pub's "Clay Worker," Indianapols.
Or by the author, A. Crossley,
Ironton, Ohio.

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Horse & Steam Power Brick and Tile Machines.

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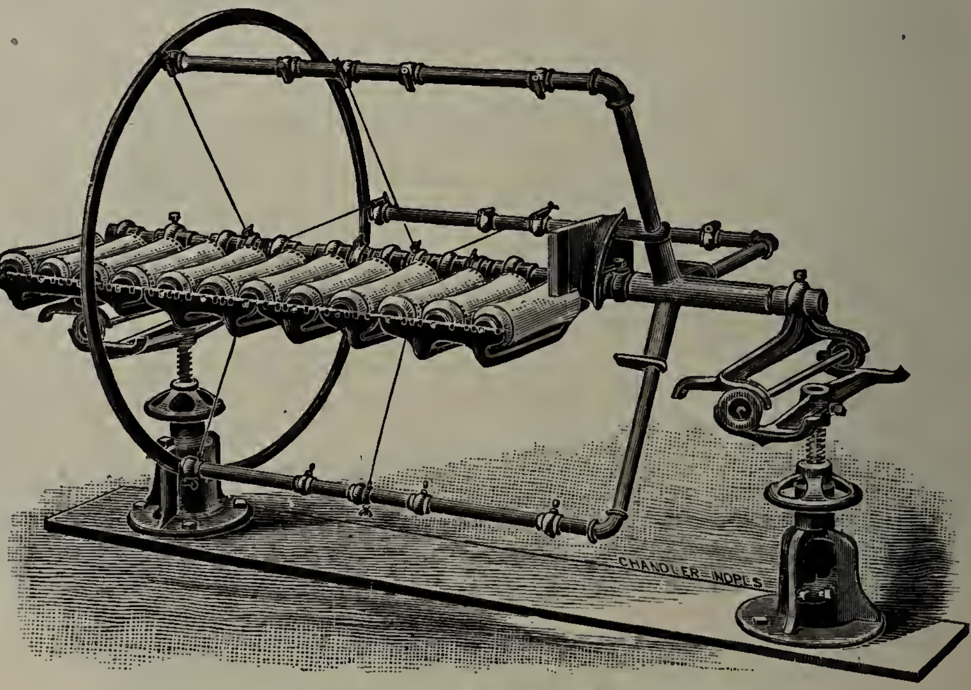
Patent Revolving Brick and Tile Table.



BEST IN THE WORLD.

Can be used with any Auger Machine,

SAVES TIME. SAVES LABOR. SAVES WARE.

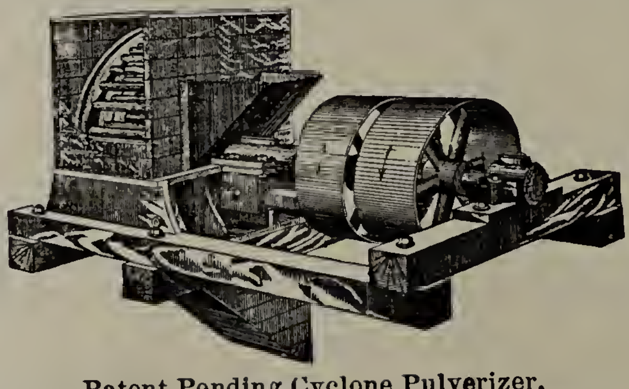
Cutting Wires pass but once through and always downward. No upward cut, nor lifting wire back through clay to rough ends of Tile or Brick. Sold on approval. Write for prices.

FATE & FREESE, Plymouth, Richland Co., Ohio.

EAGLE MACHINE WORKS MFG. CO.,

MANUFACTURERS OF

CLAYWORKING MACHINERY.



Patent Pending Cyclone Pulverizer.

The Lone Star Brick Machines, Eagle Pug Mills, Hercules Clay Rolls and Re-press Machines, Steel Moulds, Tile Mills, Etc. Pug Mills, Elevators and Engines.

940 and 942 N. Main St. (Mention Clay-Worker.) St. Louis, Mo.

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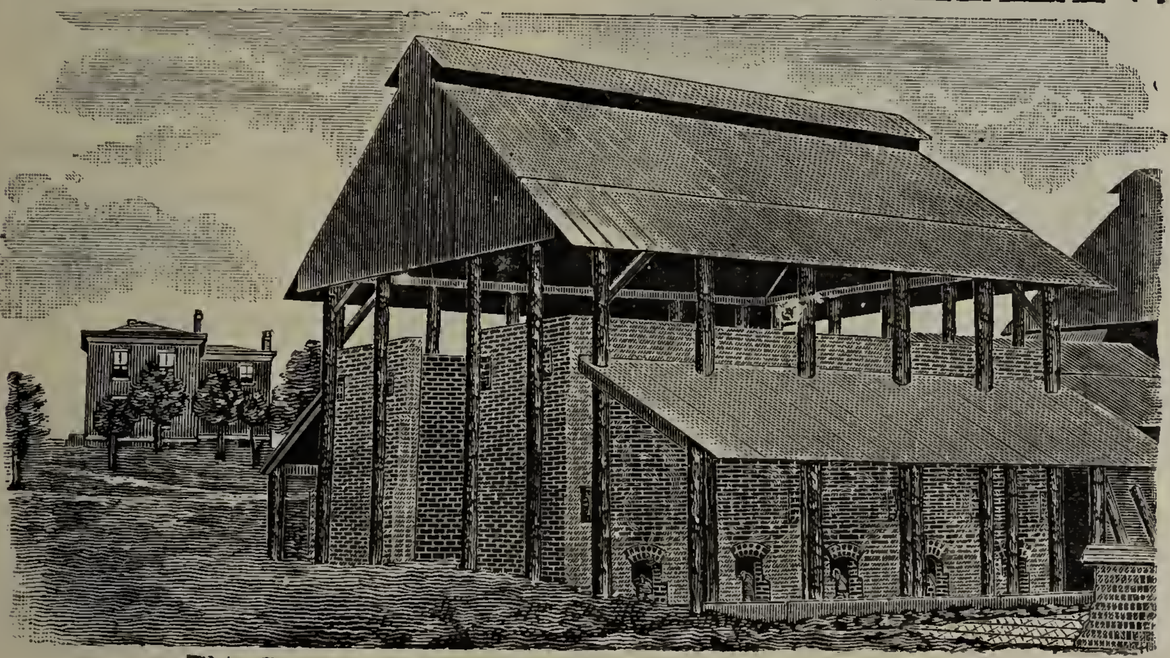
F. L. HALLS'
IMPROVED
BRICK AND TILE KILN.



This Cut is a Representation of the Patentee's Works.

In this invention I do not claim perfection, for progress is onward. There is no end to human achievements. This I do claim, that the quality of the bricks it turns out, is as good as the best; being nearly all hard burned brick. That it takes less time, less labor, and consequently less fuel in burning than any other plan of brick kiln in use, and it is easily operated.

DESCRIPTION OF BRICK KILN AND FURNACES.

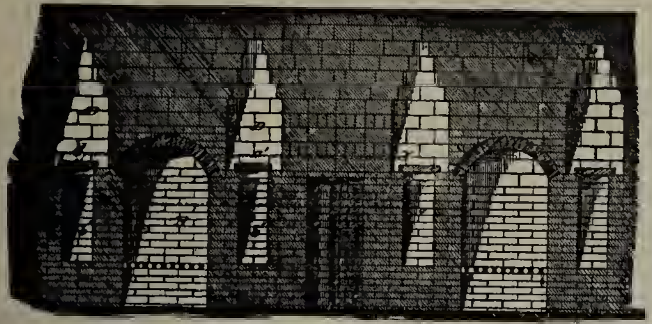


FIG. 1.

The peak holes not shown are the same as in the common case brick kilns, thus enabling one to see the state of the arches when burning. Fig. 1, is a front or side elevation with wall removed, which plainly shows the green brick kiln as it is built over the permanent mason work. Every bench alternately resting on the furnaces and the mason work which is the kiln floor. this floor is a perfect support to the crown of the furnaces. D. D. are the arches of the green brick kiln, B. the furnaces, b. b. the hot air chamber of flues. Fig. 2, is a horizontal section, showing the plan of the furnaces. B. represents the floor of grate surface, b. b. the hot air chambers. The way of the arrows show how the heat is circulated from the rear end of the furnace on each side horizontally in the hot air chambers, from thence vertically through the kiln floor or partition, having apertures into the arches of the brick kiln.

This brick kiln burns the brick of even hardness with but little fire marks. The arrangement of these furnaces are complete for perfect combustion. Also, in heating the arches of the brick kiln, there is no plan of furnaces that can equal them. The arch brick is hardly discernable and as perfect as any in the kiln.

I do not want a score of writers in their bearings to recommend this kiln *but let it stand on its own merits.* Every experienced brick maker knows that air let in through apertures at the sides or rear of furnace, it matters not in what shape, it will have a tendency to dampen the fires and cool the arches, the same will be the results, if in the rear holes it comes through the bed of coal while burning.

I have been many years engaged in the manufacture of brick, after experimenting and bringing this kiln as near perfection as it needs to be, I now offer to the brick makers yard rights, and right of terriiory, at reasonable prices, and am confident that such as may deal with me, after bringing into use this new arrangement for burning brick, will feel fully repaid for all their expenses.

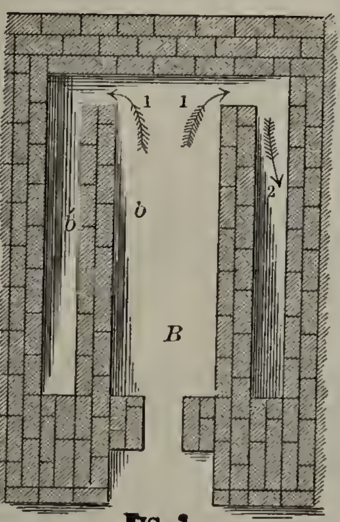


FIG. 2.

Any further information, as regards costs of Brick Kiln, construction of Furnaces, and all particulars will be cheerfully given by addressing

F. L. HALL, Patentee,
Oneida, Madison Co., N. Y.

THE
Pan-Handle
SYSTEM.

Its Territory, Facilities and Advantages Offered to the Traveling Public.

This system of railroads embraces the following lines: The Chicago, St. Louis & Pittsburgh railroad; the Jeffersonville, Madison & Indianapolis railroad, and the Indianapolis & Vincennes railroad.

The Chicago, St. Louis & Pittsburgh railroad is the Great Through Line to the East, via Columbus and Pittsburgh.

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The Indianapolis and Vincennes railroad is the direct and short line between the North, Northeast and the Southwest.

The facilities and advantages of the Pan-Handle System are in very particular in keeping with the progressive spirit of the times and the demands of the traveling public Its facilities for the transportation of its patrons are sufficiently adequate to guarantee to all comfortable and pleasant accommodations.

The prominent advantages are its Through Coach and Sleeping Car service; Through Ticket and Baggage Check System; Prompt Connections and Speedy and Safe Transit.

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H. R. DERING,
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The J. D. & W. Ry.

Short Line to Kansas City and the West.

Lv	Indianapolis	8.35 am.	11.00 pm. (daily.)
Ar	Decatur	2.43 pm.	4.00 am.
	Springfield	4.40 pm.	6.00 am.
	Jacksonville	6.10 pm.	7.12 am.
	Hannibal	9.35 pm.	10.40 am.
	Quincy	9.50 pm.	10.45 am.
	Keokuk	11.15 pm.	11.35 am.
	St Louis	6.15 pm.	7.45 am.
	Peoria	5.45 pm.	9.55 am.
	Kansas City	7.10 am.	6.30 pm.

The only line runing reclining chair cars daily between Indianapolis and Keokuk, Ia., without change, running through Decatur, Springfield, Jacksonville, Chapin, Bluffs and Clayton, Ills. To Quincy, Ills,, and Hannibal, Mo., without leaving the train.

City Ticket Office, 134 South Illinois Street, Indianapolis.

H. A. CHERRIER,
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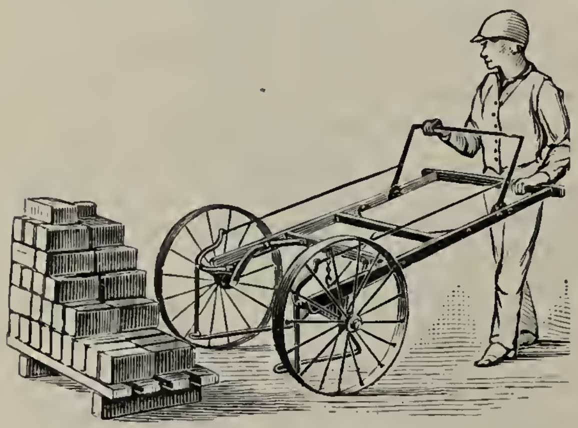
General Fr't and Tkt Agt.

STEELE'S IMPROVED Brick Truck

—AND—

Portable Hack.



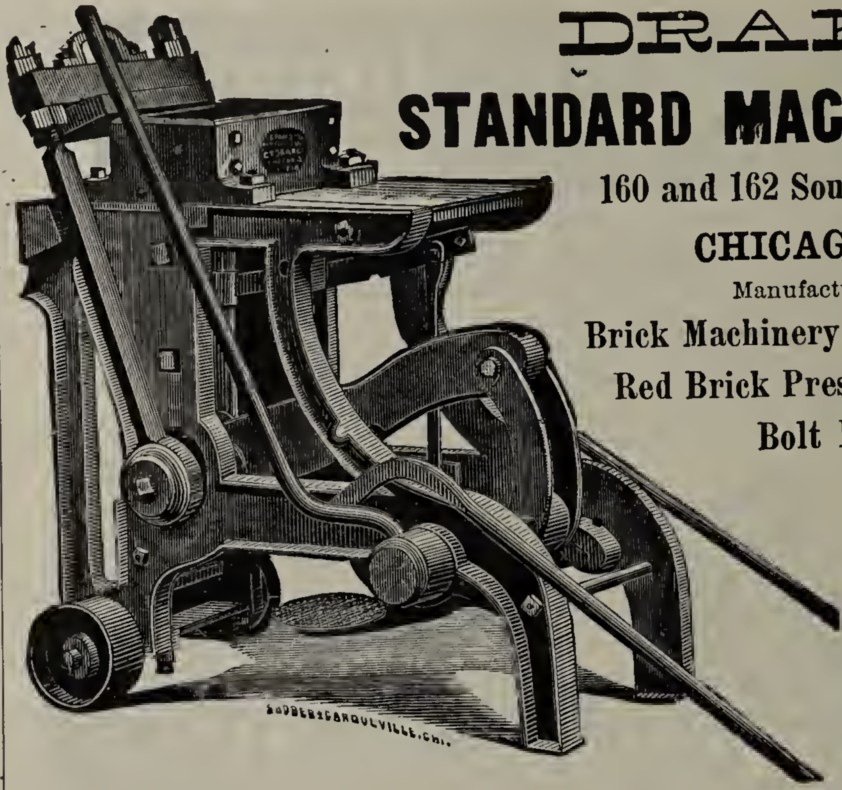
The principle of handling and drying bricks by the Portable Hack System has been perfected in this Truck and VENTILATED HACK BOARD, being the most practical Truck and method ever yet introduced, saving labor in handling and time in drying bricks. Can be used in any yard not too steep. Is especially adapted for medium dry clay machines.

☞Is fully warranted to work as represented.

Orders Solicited.

Territory for sale in the Northern and Western districts. Address,

J. C. STEELE, Patentee,
Statesville, N. C.



DRAKE'S
STANDARD MACHINE WORKS,

160 and 162 South Clinton St.,
CHICAGO, ILL.

Manufacturers of all kinds of
Brick Machinery, Clay Crushers, Fire and Red Brick Presses, Hydraulic Presses, Bolt Headers, etc.

This cut represents our Patent Press with change of liners in same Press Box for different styles of brick.

DRAKE'S CLAY CRUSHER AND STONE SEPARATOR.

WE GIVE THESE AS REFERENCES:

Best in the market for stubborn clay and to separate stones from same. Number used by brickmakers in Chicago: Alsip Brick Co., 3; Hayt & Alsip, 4; J. B. Legnard, 2; May, Purington & Co., 1; Wahl Bros., 2; John Busse, 1; Union Brick Co., 1; Chicsgo Brick and Mill Co., 1; Weckler Brick Co., 1; Adam J. Weckler, 1; L. Weirheim & Son, 1; John Sexton, 1; Chicago Brick Co., 2.

The Invincible Brick Machine.

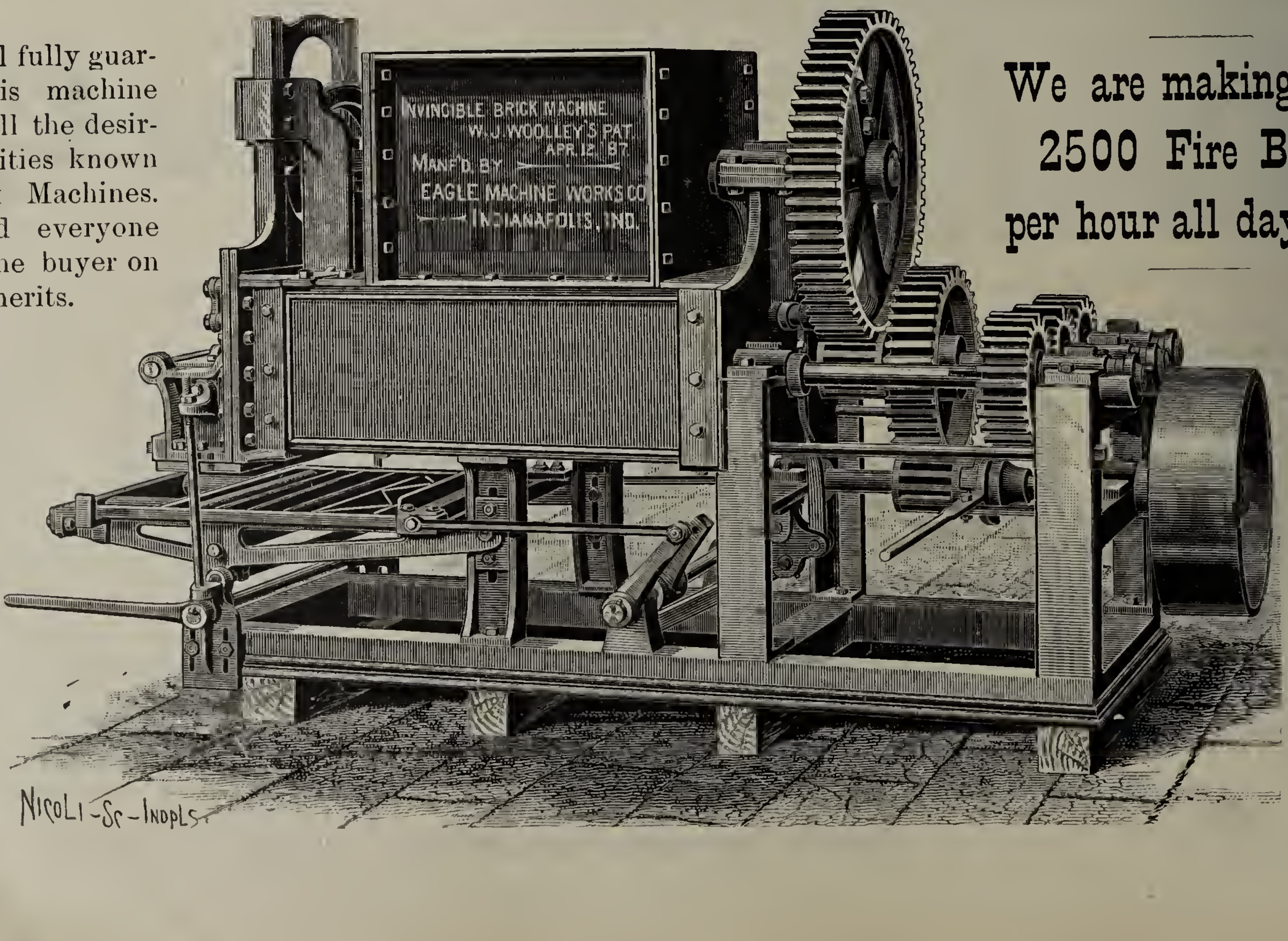
The STRONGEST, MOST DURABLE and BEST BRICK MACHINE in the market. Write for full description, prices, etc., to

EAGLE MACHINE WORKS CO., Indianapolis, Ind.

We will fully guarantee this machine to have all the desirable qualities known in Brick Machines. Each and everyone put to the buyer on its own merits.

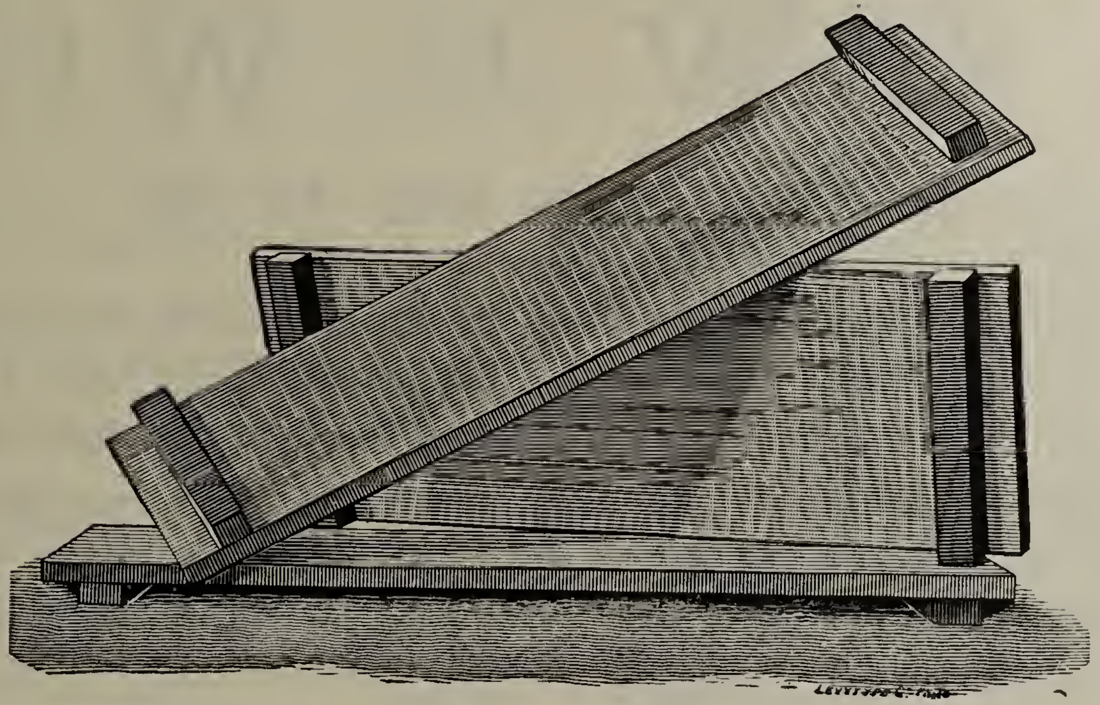
We are making over 2500 Fire Brick per hour all day long.

Nothing Equals It.



BRICK PALLETS.

BRICK PALLETS.



BRICK PALLETS.

PIPE BOARDS, ROOFING LUMBER Supplied Direct in Carload Lots.

When writing for prices, give an exact description of the kind of pallet wanted, as different pallets are in use in different sections of the country. State whether cleats are to be nailed on; also length, width and thickness of the pallet. We have a big trade in this line and can save you one profit. Write for prices.

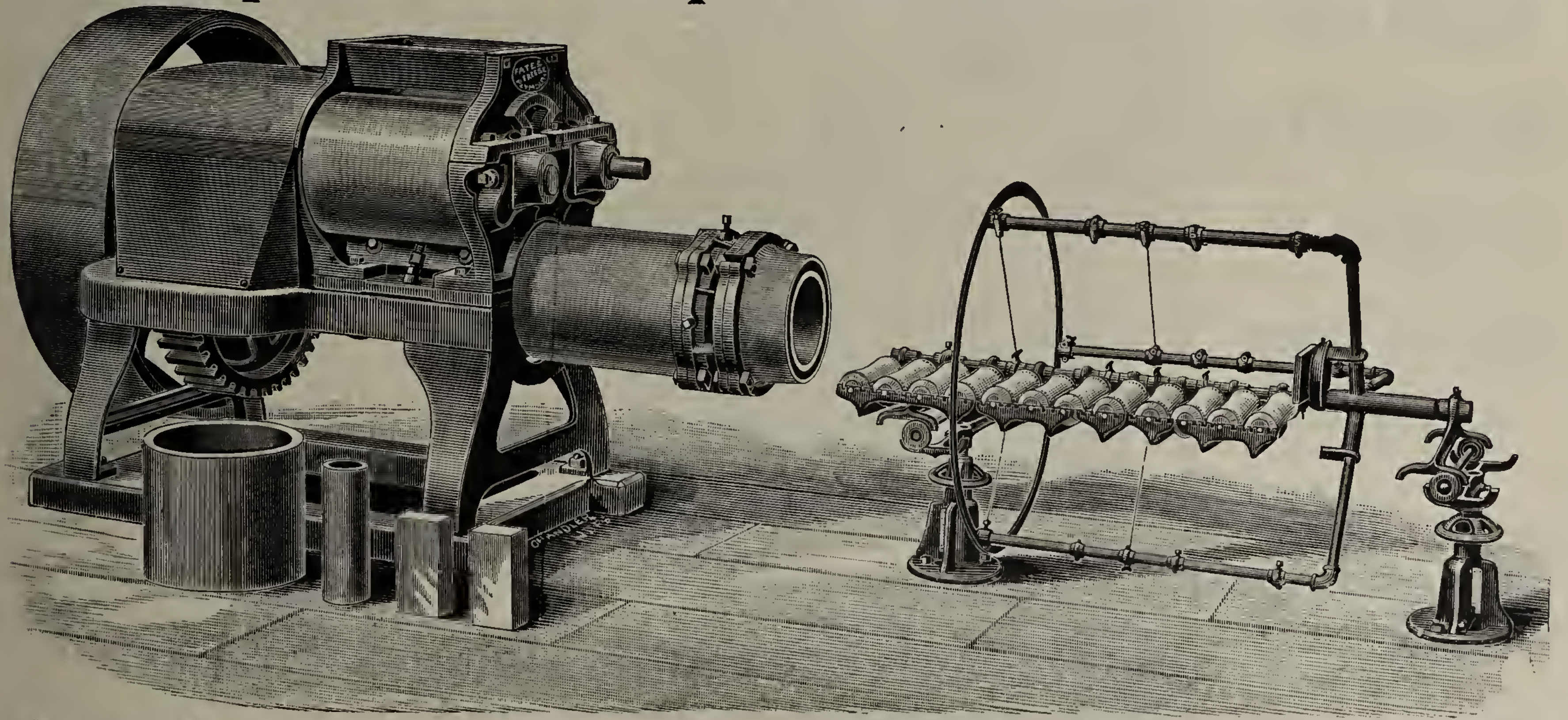
W. B. MERSHON & CO.,

Manufacturers of all kinds of white pine lumber and packing boxes in shooks.

East Saginaw, Mich.

THE OHIO BRICK AND TILE MACHINE.

Unequalled for Rapid and Perfect Work!



Most simple, durable and convenient in use. Side or end cut brick. Tile up to 15 inches. We have the latest and most approved Cutting Tables. Satisfaction guaranteed. Factory outfits furnished. Address

FATE & FREESE,

Send for particulars.

PLYMOUTH, OHIO.

THE STANDARD BRICK MACHINES

—MANUFACTURED BY—

A. M. & W. H. WILES,

Grassy Point, Rockland County, New York.

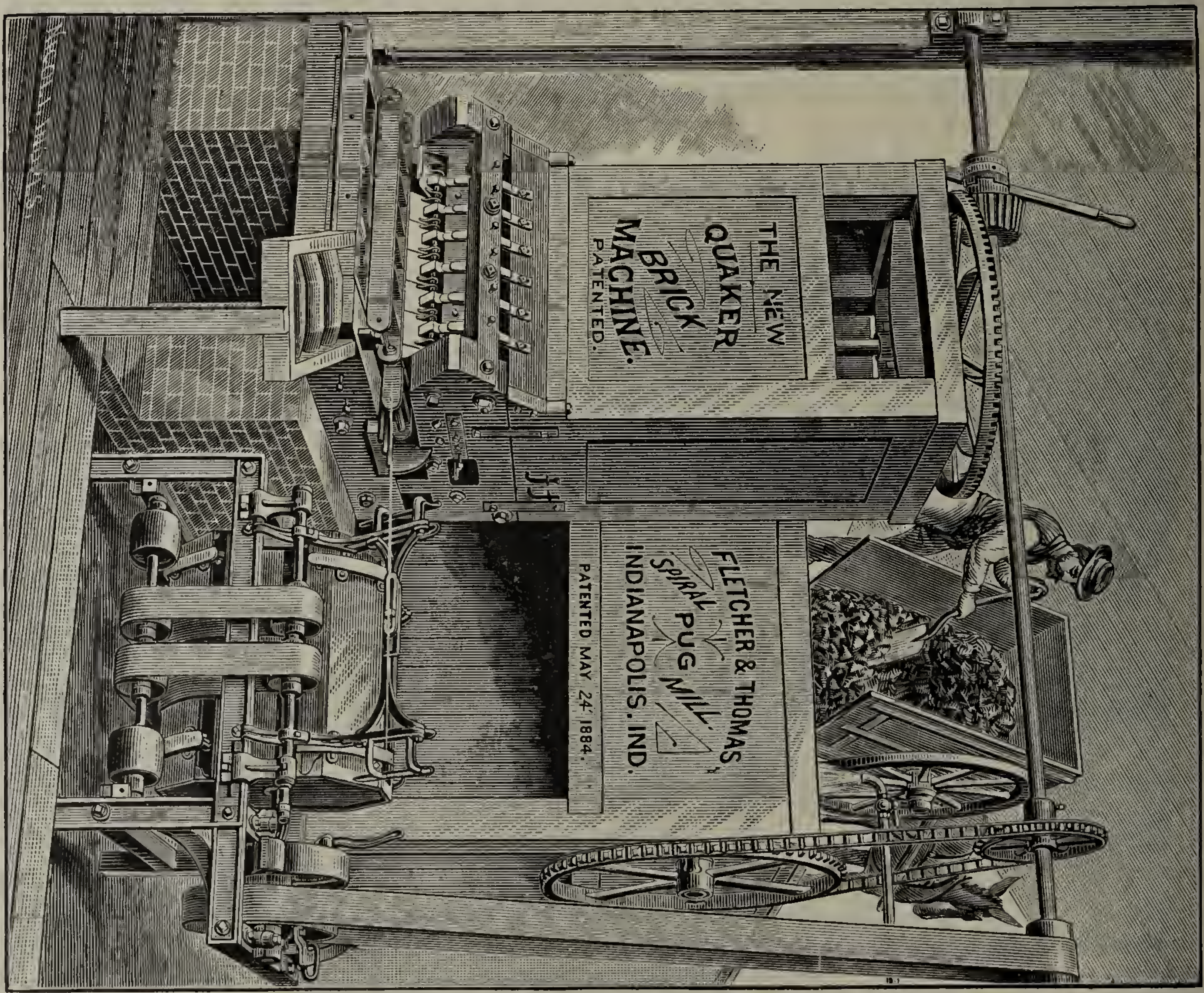
These Moulding Machines have been in constant use for over thirty years, and are the original of all machines now made that use a Pug Mill and Square Press, and they are the best and most economical machine now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brick making since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest work in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

Mention the Clay Worker. **CORRESPONDENCE SOLICITED.**

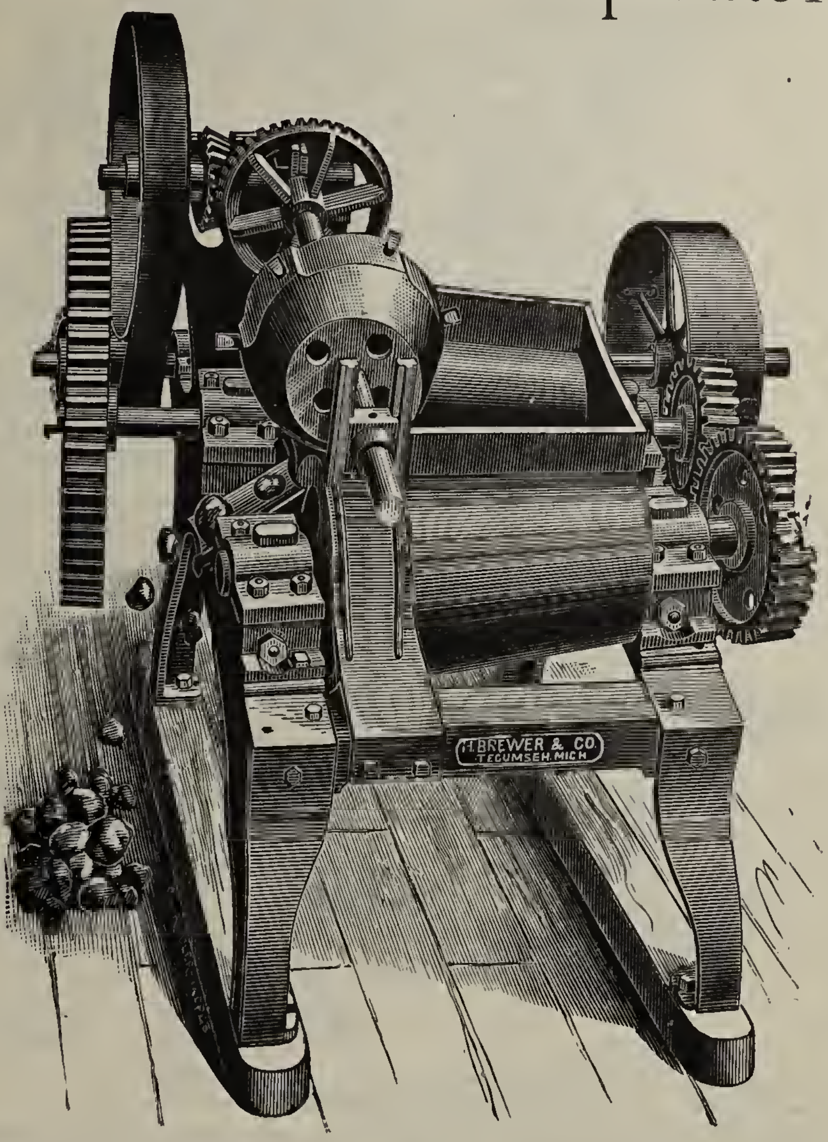
This outfit will make the largest number of the very best of Pallet Bricks at Least Cost of anything in the market. For further particulars, address


THE NEW QUAKER BRICK MACHINE.
PATENTED.
FLETCHER & THOMAS,
SPIRAL PUG MILL
INDIANAPOLIS, IND.
PATENTED MAY 24 1884.

BENNETT BROS. & CO., Wellington, Lorain Co., Ohio.

H. Brewer & Co's. Clay Crusher and Stone Separator.

The prominent feature in this Crusher is the combination of two smooth, tapering crushing rolls, running at different speeds, in connection with an adjustable transverse roll which is of irregular form and provided with teeth or spurs, whereby the clay is rapidly broken up and crushed, and the stones separated therefrom.


H. BREWER & CO.
TECUMSEH, MICH.

TESTIMONIALS.

Saunemin, Ills., May 18th, 1888.
H. Brewer & Co., Gentlemen—Your Crusher works to a charm and we are very highly pleased with it. It runs one-half easier than any other Crusher we have had.
Yours Truly,
SAUNEMIN BRICK AND TILE CO.

Budd, Ills., May 3d, 1888.
H. Brewer & Co., Dear Sirs—The Crusher and Elevator work to my entire satisfaction. I feel confident I would be $2,000 ahead, to-day, had I put in your Machine and Crusher at the start.
Yours Truly,
HENRY SIEDENTOP.

Monroe, Iowa, May 15th, 1888.
H. Brewer & Co., Gentlemen—The Crusher is giving good satisfaction and I think will do all that is claimed for it.
Yours,
T. P. BURCHINAL.

☞Do not fail to obtain our prices on Tile Machines, Brick Machines, Pug Mills, Clay Crushers, etc. For illustrated Catalogues and Price List, address

H. BREWER & CO.,
Tecumseh, Mich.

(Mention Clay-Worker.)

STEDMAN'S IMPROVED

Disintegrator and Pulverizer.

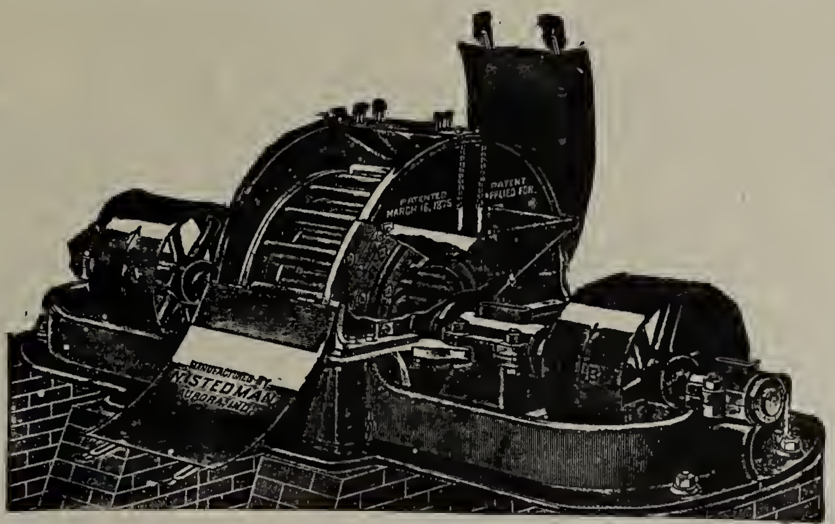
This mill will disintegrate or pulverize the following materials:

Clays of all kinds, Shale and Slate direct from the bank, for Brick and Tile.

Fire Clay and Sand Stone Rock—for Cement and Fire Brick.

Iron Ores of various kinds, Guano, Phosphates, Bones—green, dry steamed, Tankage, Bone-Ash, Salt Cake, Soda, Cracklings, Oyster Shells, Animal Matter in almost all conditions, Old Fire Brick and Tiles.

Old Pottery Ware, Plastic Clay, Asbestos, and in fact almost any material that can be disintegrated.



A good Disintegrator and Pulververizer is a long felt want in many branches of business. This Mill is an improvement over any yet made and is the result of practical experience.

This Mill is made in three sizes: 34, 40 and 48 inches. The capacity for clay is as follows:

34 inch Mill will pulverize for from 15,000 to 25,000 brick per day.

40 inch Mill will pulverize for from 20,000 to 35,000 brick per day.

48 inch Mill will pulverize for from 75,000 to 100,000 brick per day.

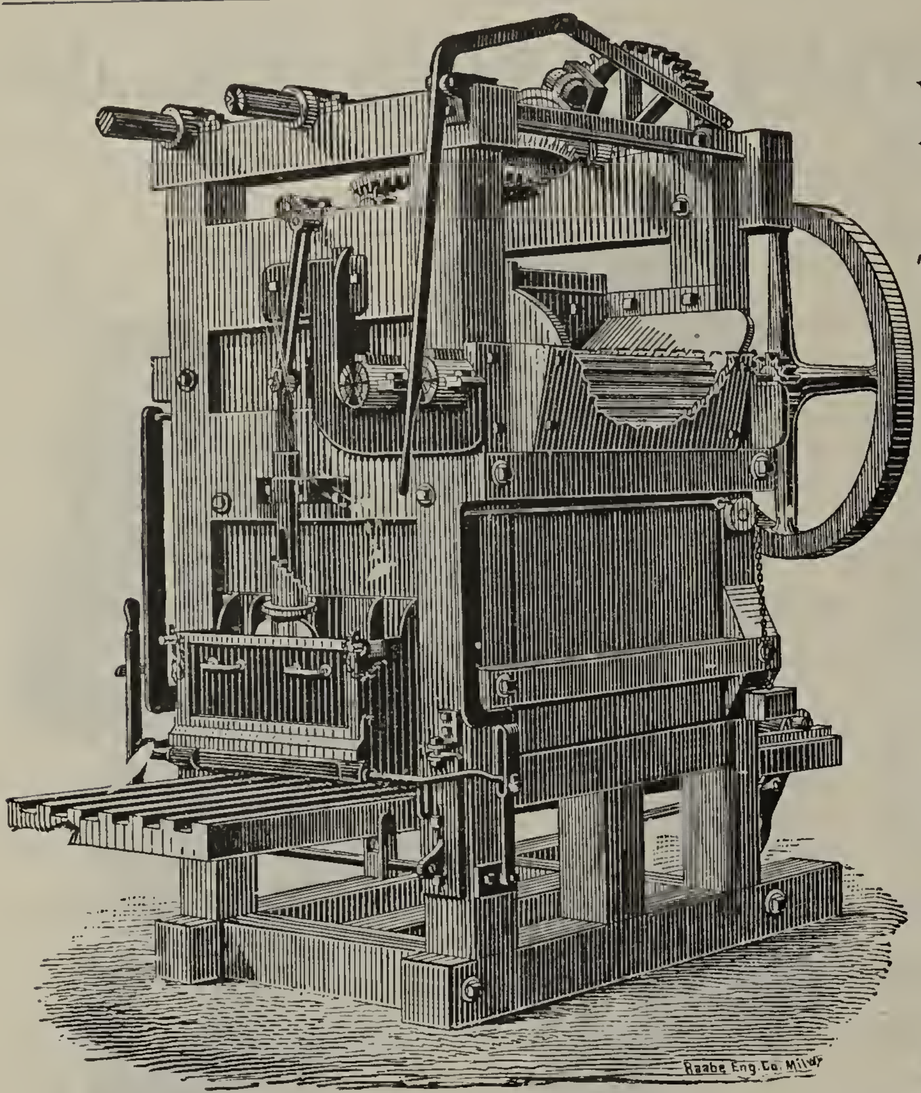
To Brick, Tile and Pottery Men and to Terra Cotta Works this Mill is invaluable. It reduces the clay to a fine, light and soft condition, with its full adhesive properties retained.

For Prices and any other Information, Address

Stedman's Foundry and Machine Works,

PROTECTED BY PATENTS.
[Mention the Clay-Worker.]

AURORA, IND.


Raabe Eng. Co. Milw.

GURNEY
BRICK MACHINE WORKS,

MILWAUKEE, WISCONSIN,

Manufacturers of

THE GURNEY BRICK MACHINE

—Having Crushers Inside of Pug Mill.—

THIS is the only Machine in use which has the *combination of Crushers, Mixing and Moulding Apparatus* in a single machine. The arrangement is covered by patent issued October 6, 1885.

This machine will work any clay, however hard and lumpy, with no preparation before soaking in the usual way. The Crushers will take the clay through as fast as the machine will turn out the brick, *doing entirely away with lumps*, which brickmakers know have been much in the way of making good brick, and also have caused great loss by breakage.

The Machine will turn out four thousand, or more, good, smooth, square brick an hour. With proper moulding sand THE BRICK FROM THIS MACHINE, *made from any clay*, WILL SLIP EASILY. The Machine has been thoroughly tried in different parts of the country.

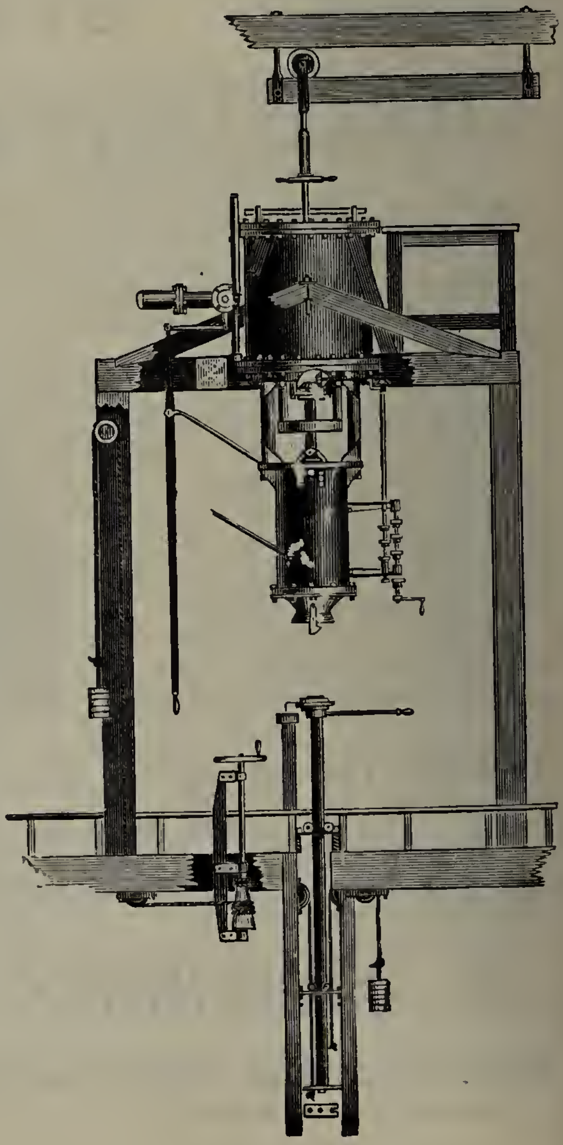
Also First-Class STEAM and HORSE-POWER MACHINES of same pattern, without Crushers.

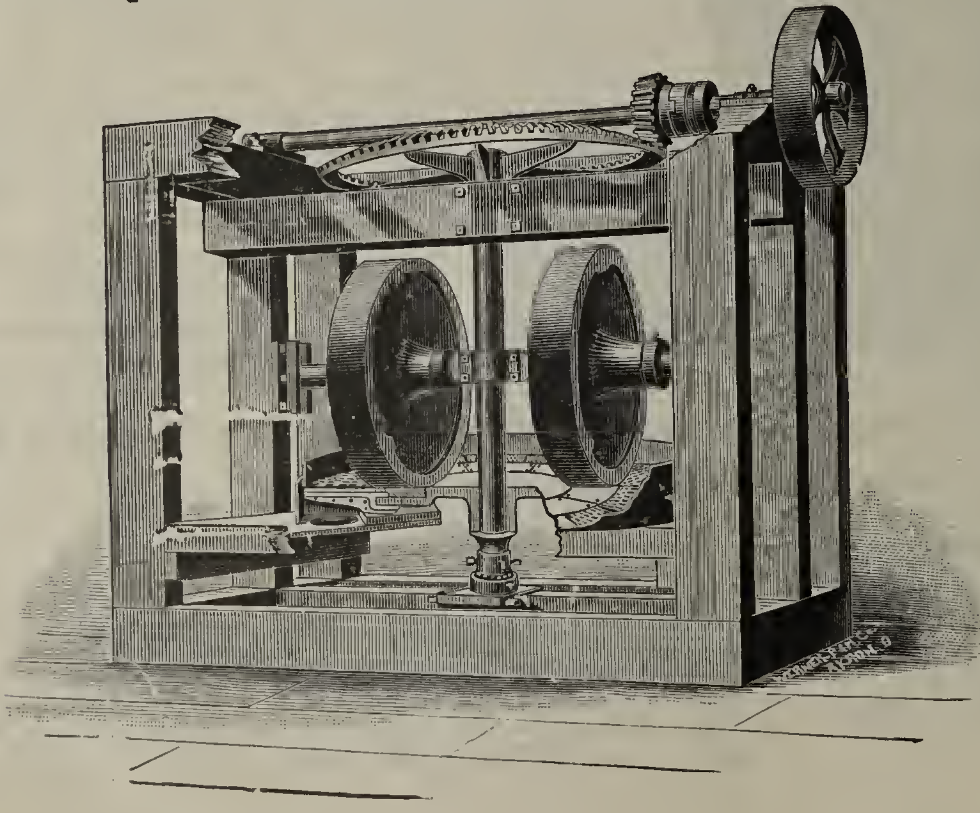
For further information and Illustrated Catalogue address—

T. C. GURNEY,
100 Wisconsin St., MILWAUKEE, WIS.

TAPLIN, RICE & CO.,
AKRON, O.

Manufacturers of Improved Clay Working Machinery of all kinds, such as Clay Mills, Dry and Wet Pans, the Barber Steam Sewer Pipe Press, Dies, Clay Blockers, Potters' Wheels and machinery of every description. Write for circulars.



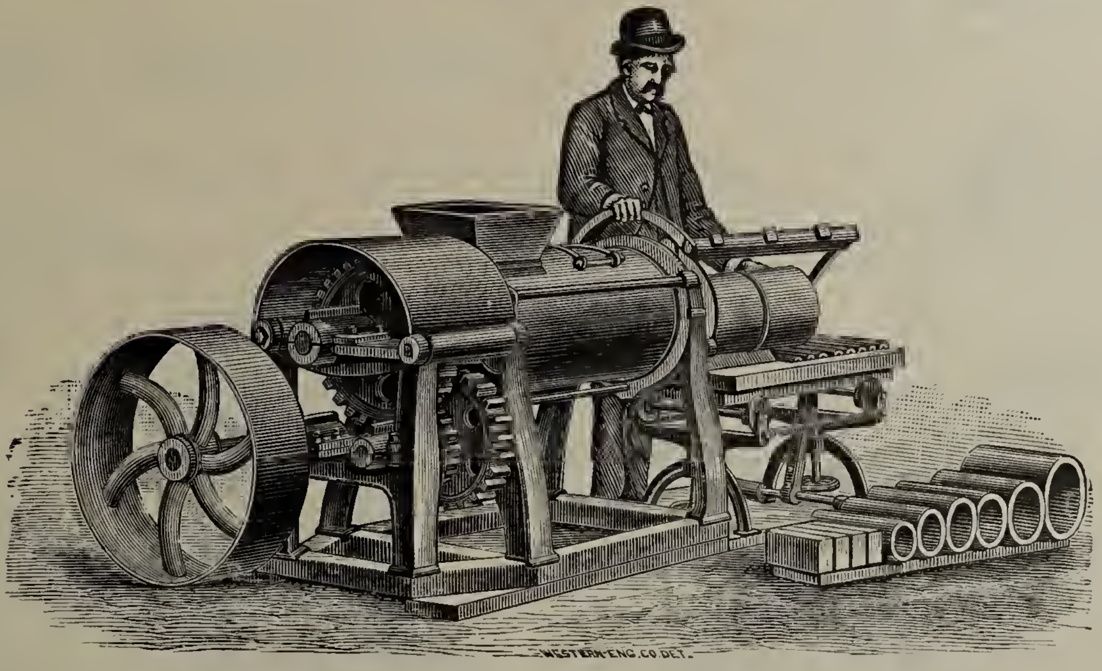


MICHIGAN BRICK AND TILE MACHINE WORKS,

—MANUFACTURERS OF—

Brick and Tile Machinery.

Our new CUT-OFF TABLE for side cut brick, cuts either way and is worked by a cam, thus enabling us to cut on a circle and to make a brick when dry and burned that is absolutely perfect. Side cut brick when cut straight are always warped, especially brick made by auger machines. Our invention overcomes this objection and it is the only cut-off made that will produce a perfectly straight brick when burned. This cut-off can be used on any machine.


WESTERN ENG. CO. DET.

The Michigan Brick and Tile Machine.

TWO SIZES { No. 1 makes tile from 2½ to 12 inches.
No. 2 makes tile from 2 to 8 inches.
Either Side or End-cut Brick.

1856.

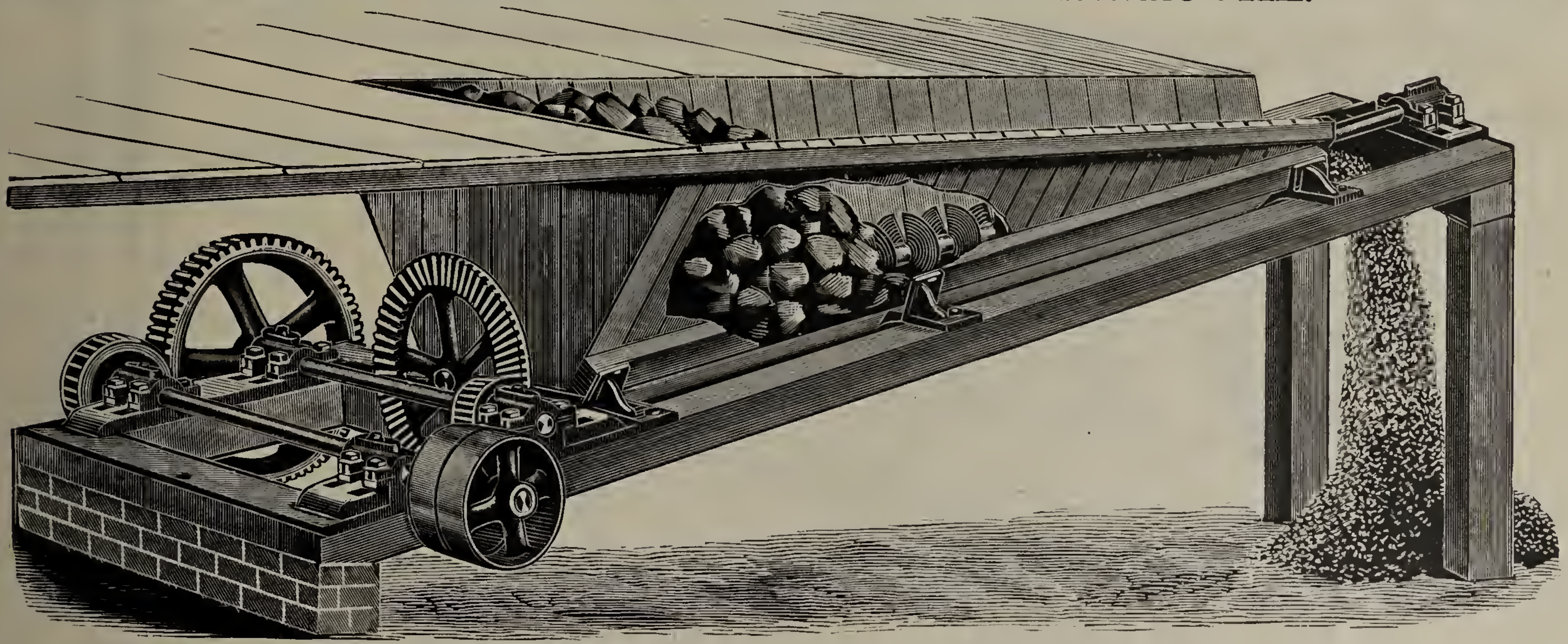
Thirty-three Years of Practical Experience.

1889.

MICHIGAN BRICK AND TILE MACHINE WORKS.
Lenawee County, MORENCI, MICH., U. S. A.

Emen's Patent Perfection Clay Granulator and Feeder.

SOLD SUBJECT TO TRIAL AND APPROVAL.



Saves time and labor and produces better ware; simple in construction; rapid and accurate in operation. Every brick, tile and sewer pipe manufacturer should investigate the merits of this machine.

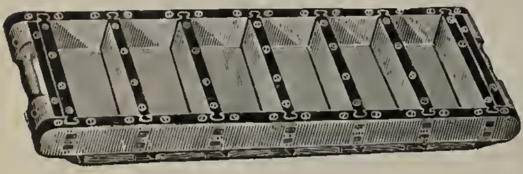
During the past season it was introduced in several of the leading Chicago brickyards and is now at work giving entire satisfaction. Write for descriptive circulars.

Chambers Brothers Company, of Philadelphia, Pa., are licensed to manufacture and sell these machines.

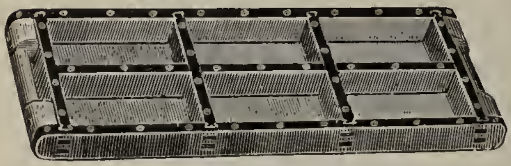
EMENS AND COLE

[Mention Clay-Worker.] HOLTON, (MUSKEGON CO.) MICH.

6 B. MACHINE MOULD.



6 B. HAND MOULD.



3 B. HAND MOULD.

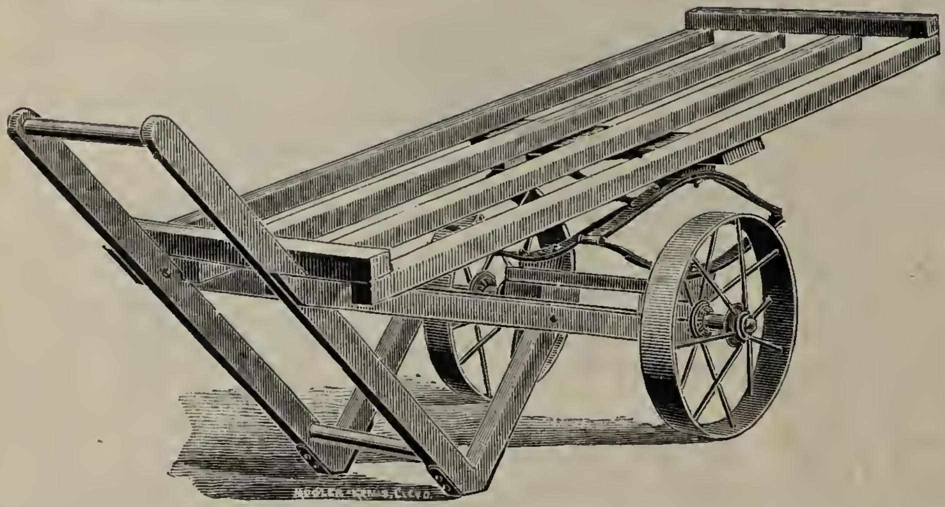
D. J. C. ARNOLD,

MAKES ∵ BRICK ∵ YARD ∵ SUPPLIES

At NEW LONDON, OHIO.

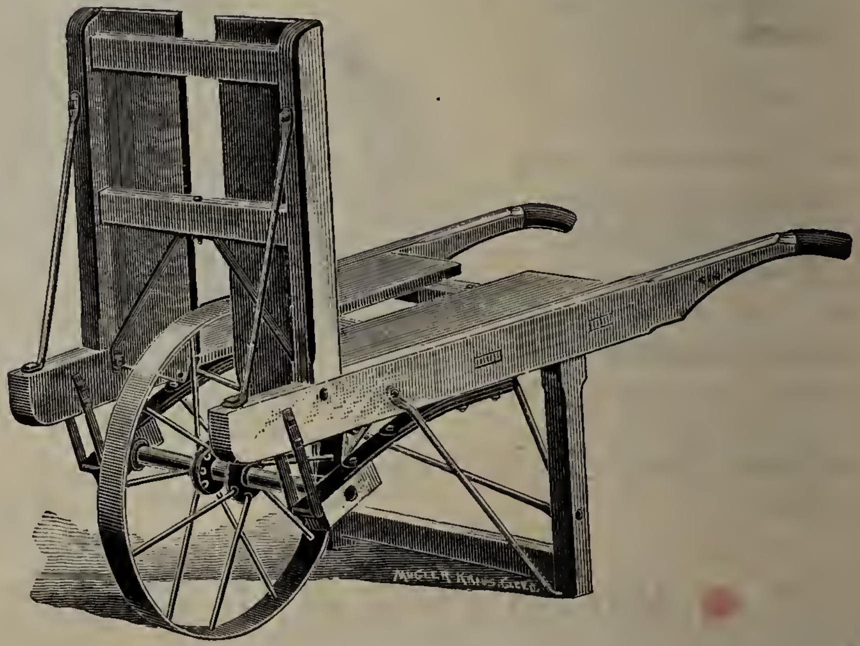
Get his prices before you buy. All goods first-class in every respect.

[Mention the Clay-Worker.] ☞Catalogue sent on application.



MOSLER-KRAUS-CLEVE.

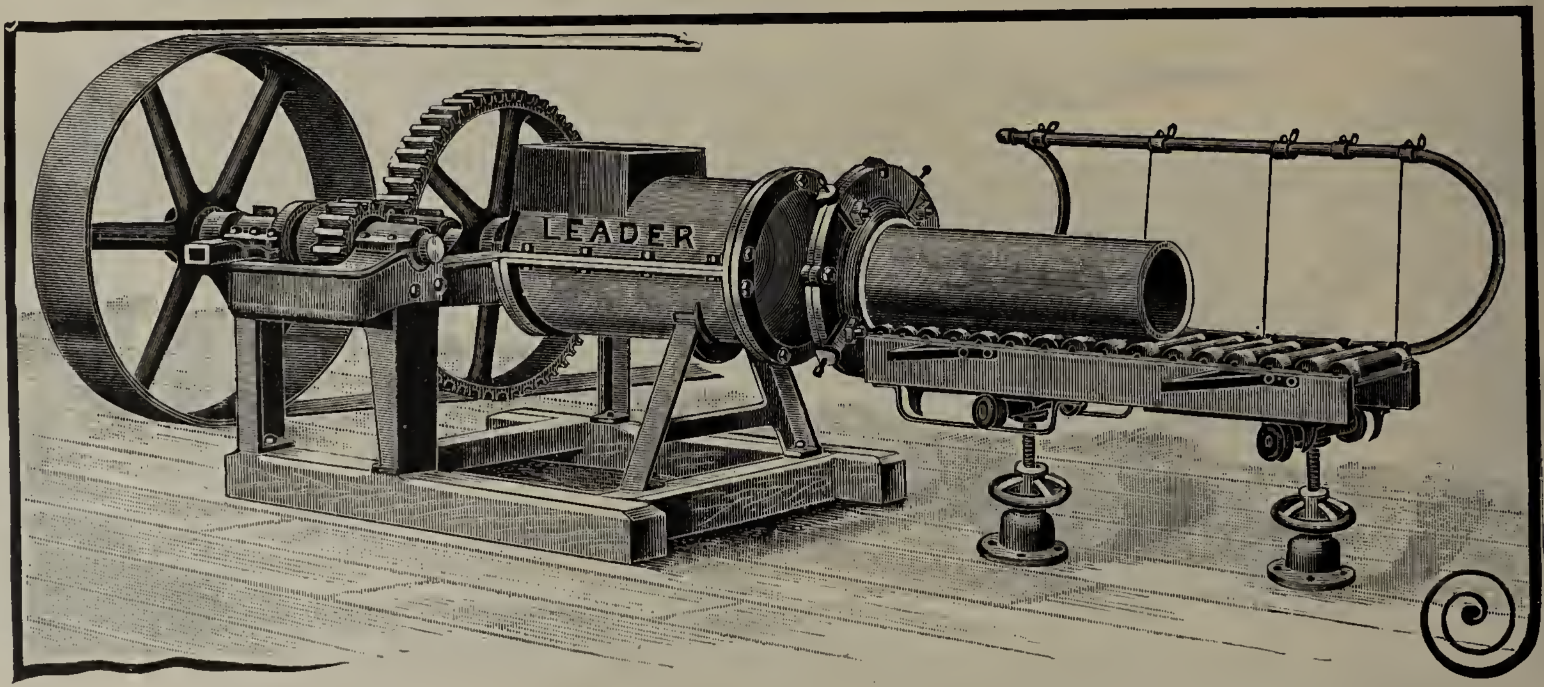
NO. 10 SPRING TRUCK.
(Weight 100 pounds.)



MOSLER-KRAUS-CLEVE.

NO. 1 BRICK BARROW.
(Weight with springs 100 lbs.)

THE LEADER BRICK AND TILE MACHINE.



We manufacture the very latest and best designs of Tile Machines, Brick Machines, Clay Crushers, Elevators and Dump Cars for handling clay by steam. Design special clay-working machinery to order. Have a large stock of the best cutting wire. Correspondence solicited.

BROWN & HARROP MFG. CO.,
PORTLAND, IND.

Geo. S. Pollock, Agent, Sullivan, Ind

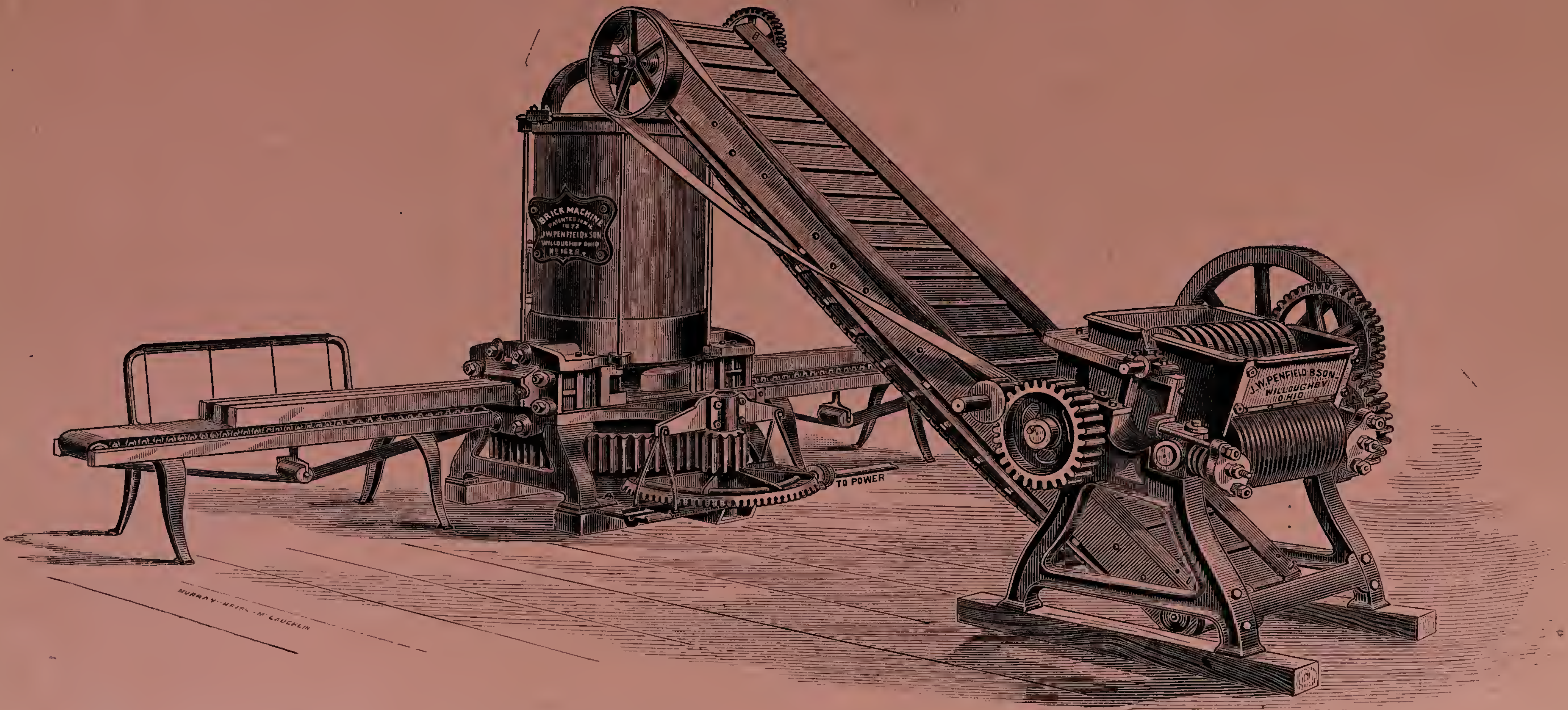
The Penfield Stiff Clay Machines

Are UNEXCELLED For the Manufacture of

COMMON BRICK, FACE BRICK, ORNANENTAL BRICK,

Paving Brick,

FIRE PROOF BUILDING MATERIAL, TERRA COTTA LUMBER.



We manufacture machines of all capacities, from 15,000 to 80,000 per day.

☞For full particulars address the manufacturers,

J. W. PENFIELD & SON,

WILLOUGHBY, OHIO, U. S. A.

Mention the Clay-Worker.]

J. W. PENFIELD & SON,

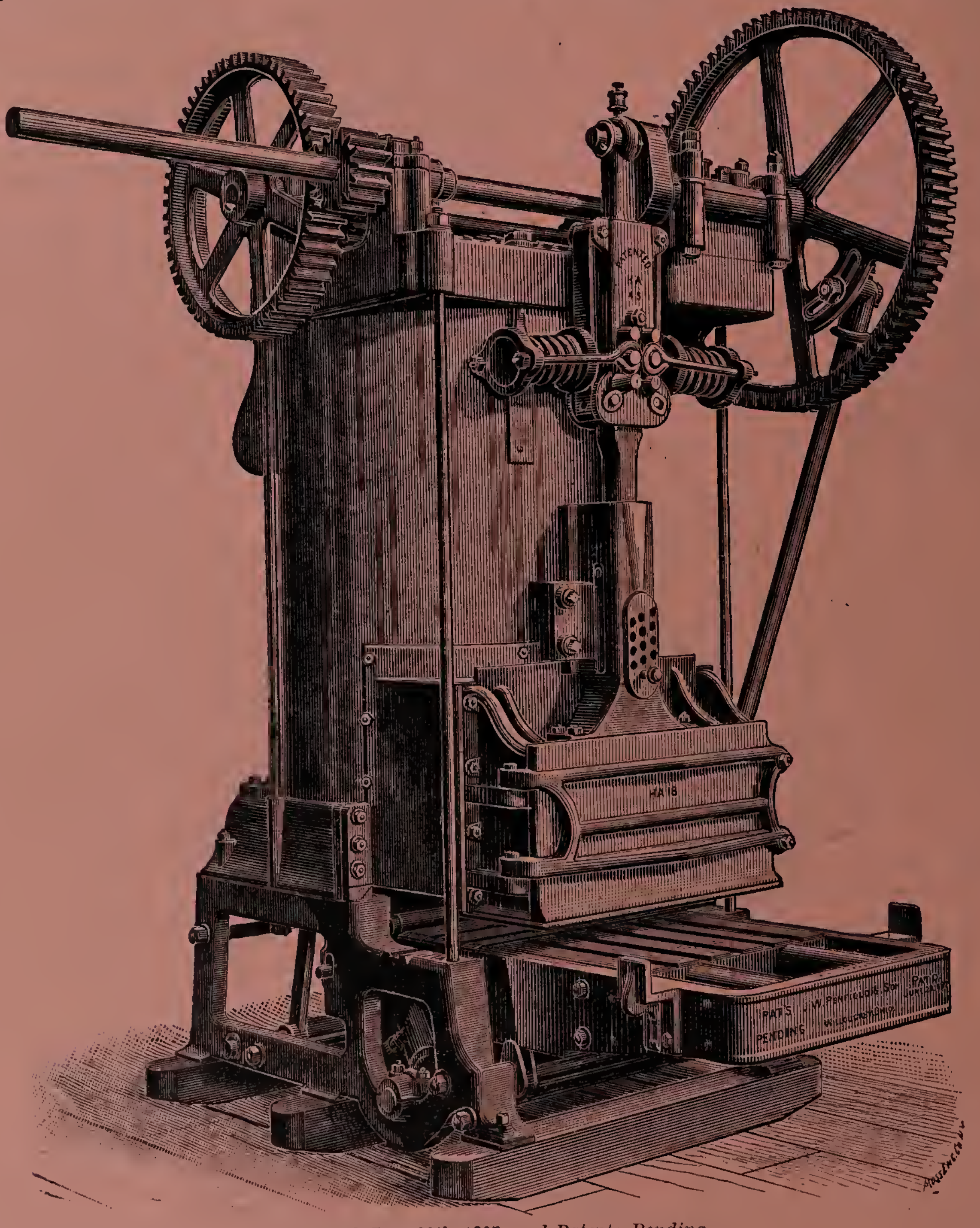
WILLOUGHBY, OHIO, U. S. A.

—MANUFACTURERS OF—

Clay Working Machinery,

Including Stiff Clay and Soft Mud Brick Machines, Tile Machines, Clay Crushers and Stone Separators, Stiff Clay and Soft Mud Pug Mills, Granulators, Elevators, Kiln Castings, Yard Supplies, Dry Cars, Pulleys, Shafting, Etc

WE HANDLE ENGINES AND BOILERS. OUR PATENT STEAM DRIERS IS THE BEST.



[*Patented June 28th, 1887, and Patents Pending.*

OUR NEW UPRIGHT STOCK BRICK MACHINE.

THE LATEST AND BEST MACHINE ON THE MARKET FOR SAND MOULDED BRICK.

All Iron and Steel.

Moulds the Clay Stiff Enough to Make the Finest Stock Brick. Provided with all the Latest Improvements, Ensuring Convenience, FREEDOM FROM BREAKAGE, Large Capacity and Best Work. Is furnished either with or without Direct-Attached Pug Mill.

Send for Complete Descriptive Circular.

Read the other side. **Come and see us.** **Always Consult the Colored Page**

ATTENTION BRICKMAKERS!

The practical and enterprising brickmakers throughout the country have long been on the lookout for a machine that would produce better results than the inferior sand moulding machines heretofore placed on the market, and it was to fill this long felt want that we constructed our

UPRIGHT STOCK BRICK MACHINE.

This machine by its superior construction and pdrfect operation has far exceeded our most sanguine expectations, and All Practical Brickmakers who have seen it and witnessed its operation unite in the verdict that it is The Best Sand Moulding Machine made.

DON'T

Buy inferior machinery because it is cheap, for if you wish to attain the highest possible degree of success in your business, it will pay you to buy the Best, namely

THE PENFIELD UPRIGHT STOCK BRICK MACHINE.

It is built throughout with Iron and Steel. It is extremely heavy, and perfectly rigid. It has no wooden parts to decay. It is provided with all the latest improvements, including automatic reliefs, preventing breakage. It has separate gearing for doing the pressing and the pugging. It will make six of the largest brick in each mould. It will make Each One of these six brick perfect in shape, with good sharp corners, in fact a perfect stock brick of the finest quality. Each One of these six brick will leave the mould readily. Each One of these six brick will be of equal density, as the machine fills and presses the end moulds as evenly as the centre moulds. If the brick are repressed, they will produce fine pressed brick, of Uniform Size. The front of the pressing chamber is hinged, ensuring convenience. The machine is light running. It is furnished either with or without direct attached pug mill.

For full particulars address the manufacturers,

J. W. PENFIELD & SON,

Willoughby, Ohio, U. S. A.

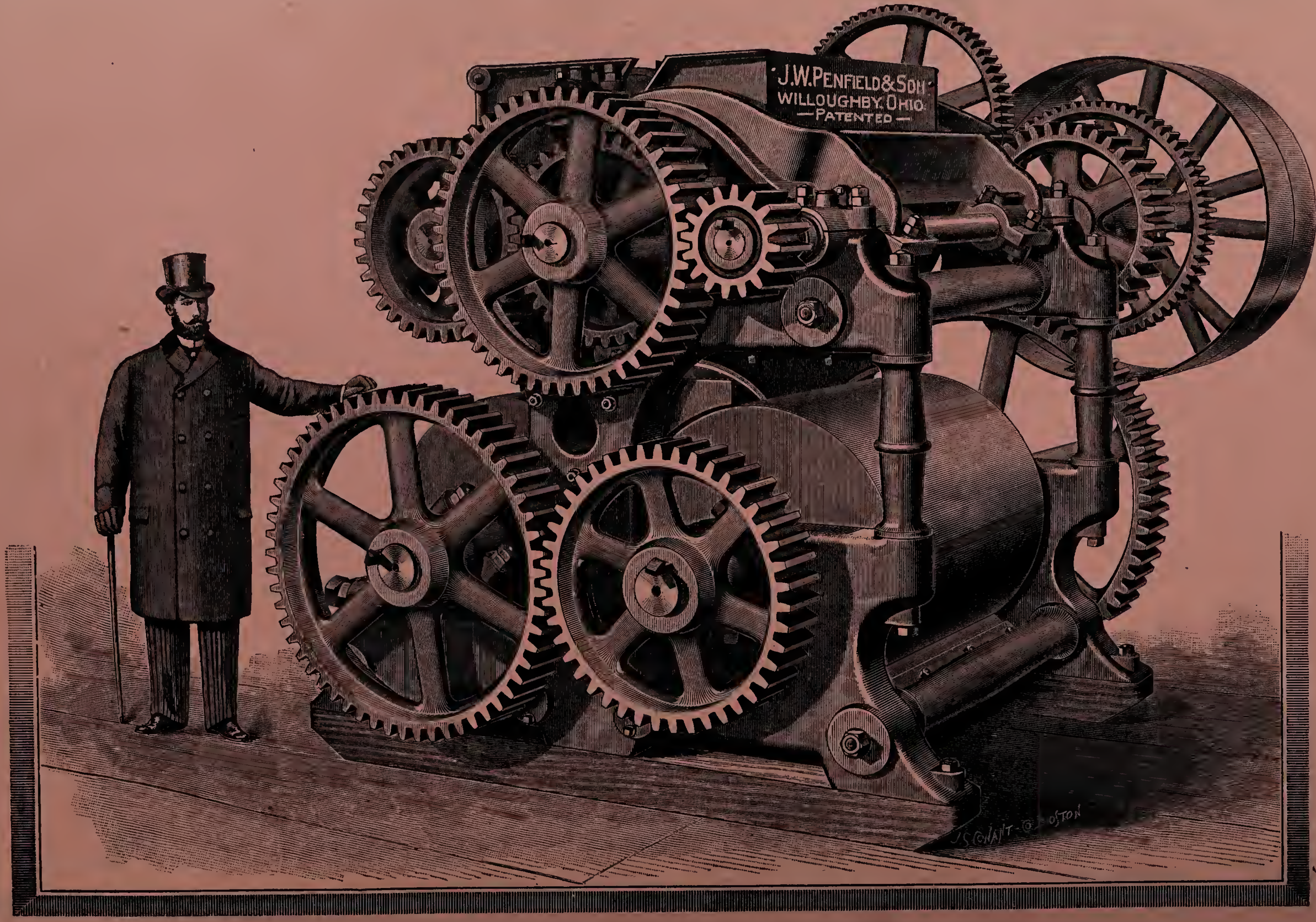
[Mention the Clay-Worker].

ALWAYS BUY THE PENFIELD

CLAY CRUSHERS AND STONE SEPARATORS.

SATISFACTION GUARANTEED.

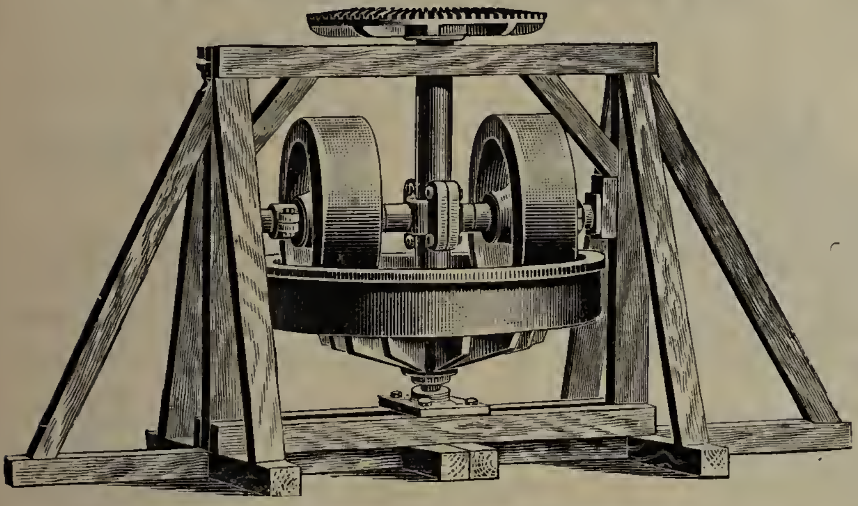
THEY ARE THE BEST!



The above cut represents our No. 2 Four Roll Crusher and Stone Separator, with Automatic Feeder. It will crush clay for 60,000 to 100,000 brick per day. Crushers furnished of any capacity.

J. W. PENFIELD & SON, Manufacturers, - - Willoughby, Ohio, U. S. A.

THE FROST
Dry & Wet-Pan Crushers, Chasers, Etc.,



—FOR—

BRICK, TERRA-COTTA, SEWER PIPE AND FIRE CLAY.

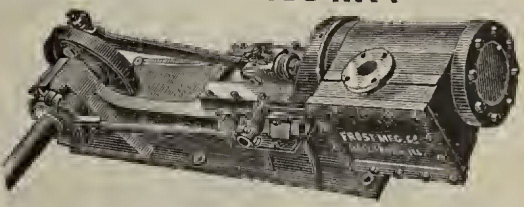
—o—

The best and cheapest machines made for working hard clay, soap stone, grog, etc.

Write for prices and other information.

THE FROST ENGINE Co.
GALESBURG, ILL.

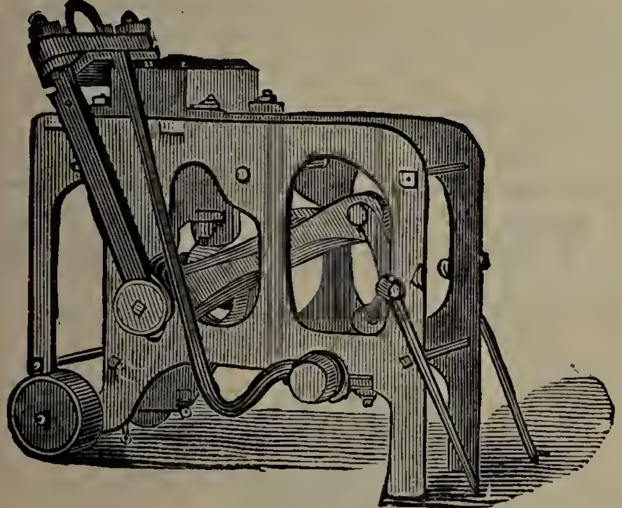
ALL SIZES UP TO 150 H. P.



ELEVATOR SUPPLIES

PULLEYS, SHAFTING, SPROCKETS, BUCKETS, BELTING, SHELLERS, CLEANERS, MILLS, &C.

SEND FOR CATALOGUES



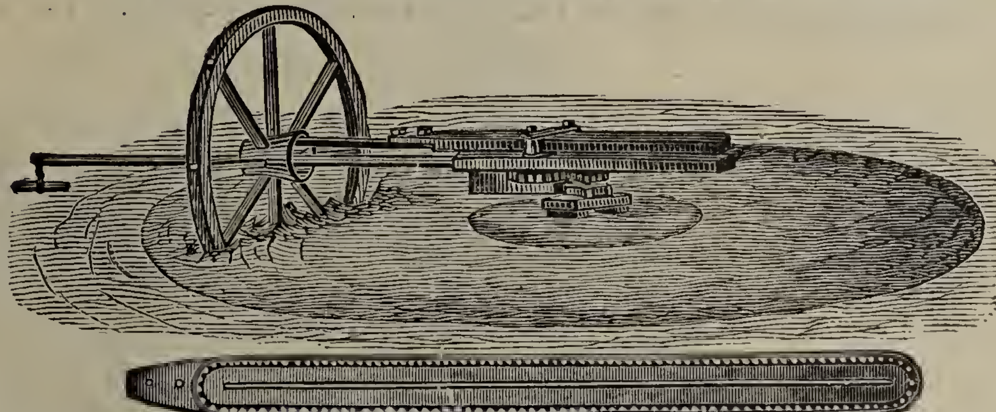
RED BRICK PRESS.

GEORGE CARNELL,
Nos. 1819 and 1821 Germantown Avenue,
and Fifth St.,
PHILADELPHIA, PA.

☞ Send for Circular and Price-List.

Philadelphia Brick Machine Works
—MANUFACTURER OF—
FIRE AND RED BRICK PRESSES.

Various sizes, from the smallest size up to 24 inches; also, manufacturer of **Clay Mills, Tempering Machinery,** and all kinds of **Brickmakers' Tools.**



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and is fitted up ten per cent. cheaper.

☞ Mention THE CLAY WORKER.

ESTABLISHED 1812,
AND CONTINUED ON THE SAME PREMISES EVER SINCE.

MILLER'S
BRICK PRESSES,
Introduced 1844 Latest Improved Patents, Aug. 28, 1883.

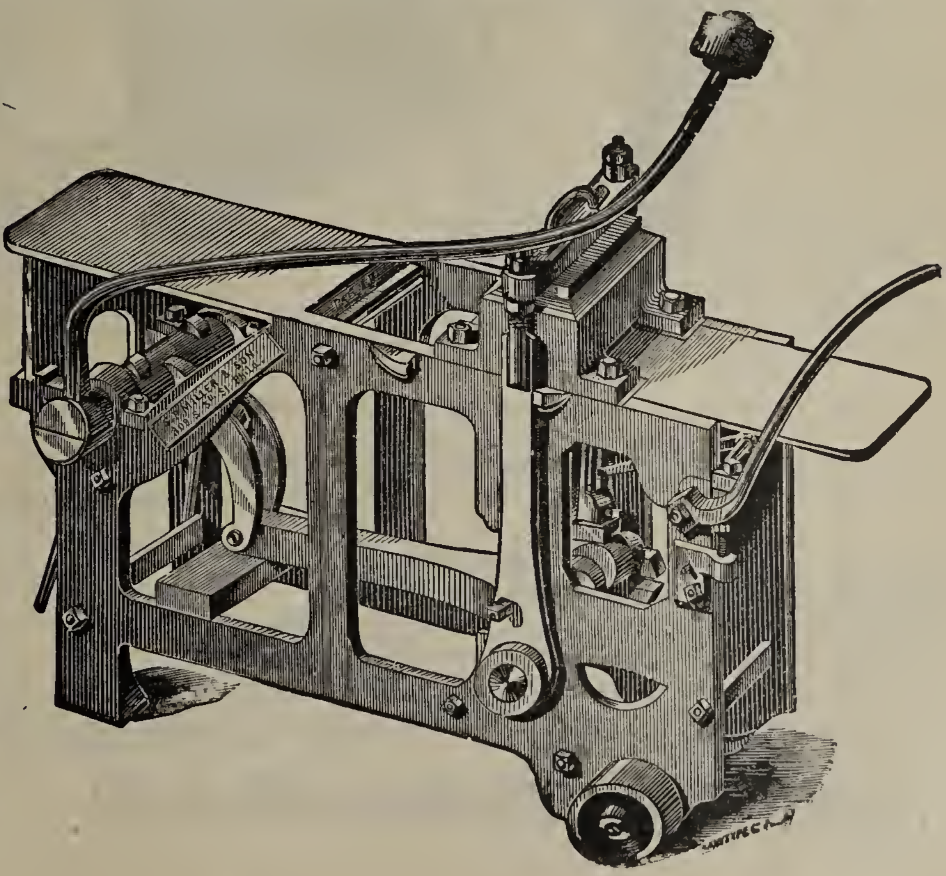
SAMUEL P. MILLER & SON,
MAUFACTURERS OF
RED AND FIRE BRICK PRESSES,

Of five different styles, embodying all the improvements in Hand Brick Presses in use.

Clay Wheels with Reciprocating Rack, Kiln Castings, Brick Moulds, Clay Spades, and the Tools in General Use for Brick Making.

No. 309 SOUTH FIFTH ST., PHILADELPHIA, PA.

S. P. M. & Son refer to Brickmakers generally. ☞ Orders from abroad promptly attended to.

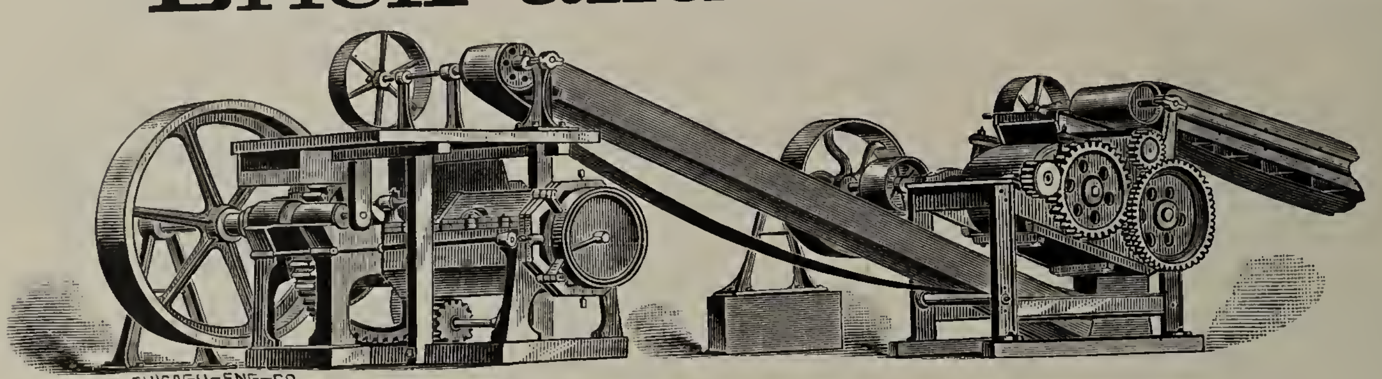


Adrian Brick and Tile Machine Co., Adrian, Mich.,

—MANUFACTURERS OF—

Brick and Tile Machinery,

Clay Crushers,
Engines
and boilers.



Also Daso's Builders' and Contractors' Elevators. Steam Fittings and Iron and Brass Castings Furnished to Order.

The working qualities of our machinery at its present state of development as estimated by one of the prominent Brick Manufacturing Companies of Kansas City, are stated in the following reply to a letter of inquiry addressed to them:

KANSAS CITY, MO., August 21, 1888.

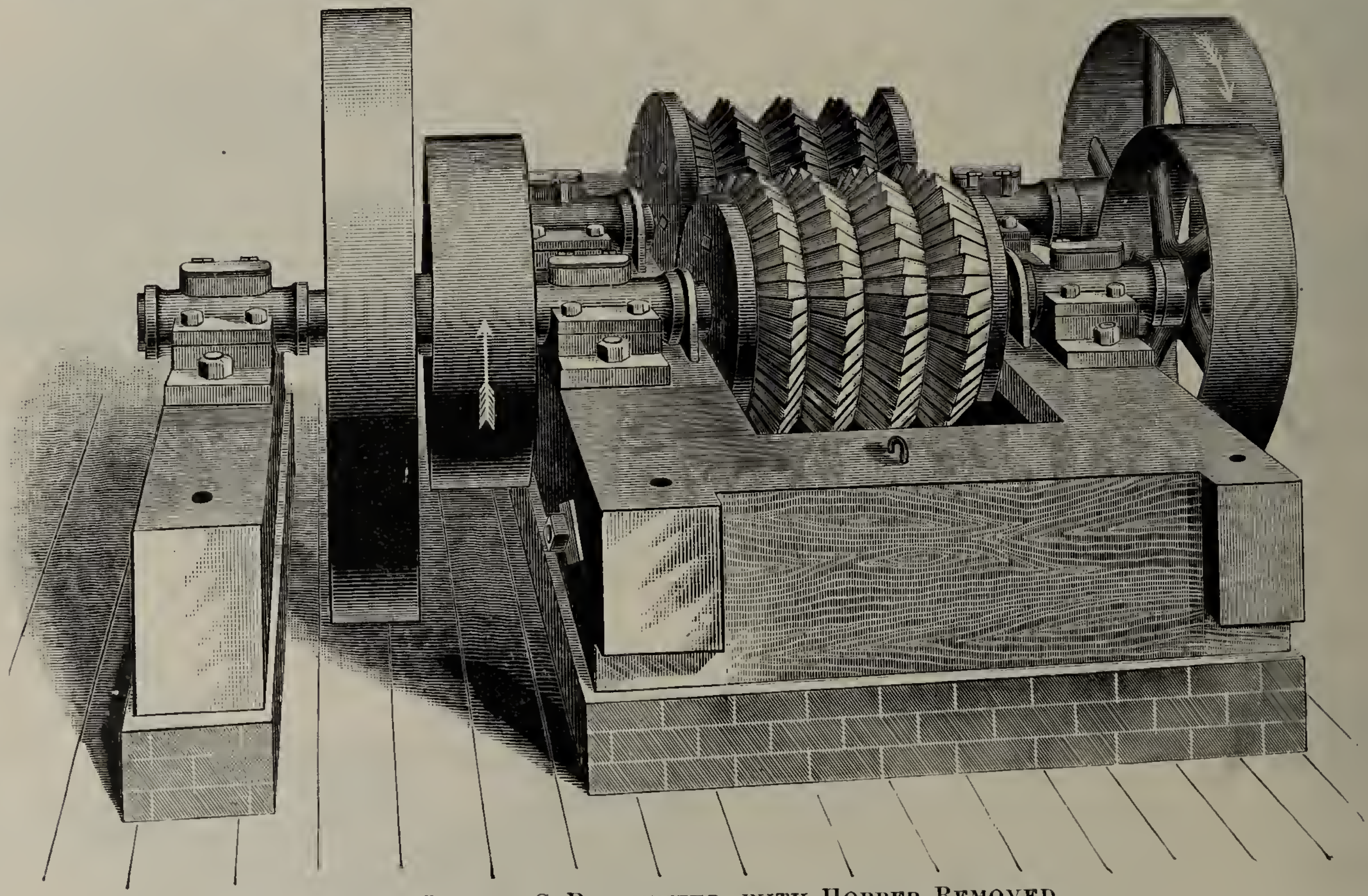
JOHN GIBSON, Esq., Monticello, Iowa:

DEAR SIR—In answer to your favor of the 16th will say, that we do not think there is any room for improvement in the Adrian Brick and Tile Machine Co's No. 4 Cut-off Table, as it cuts the brick as near perfect as possible, without tearing the edges; thus leaving the ends of the brick as perfect as the face. We are also using the new dies on both our machines, and are well pleased with them, as they are 100 per cent. better than the old style and turn out a perfect column of clay without warping or twisting. We have two No. 3 McKenzie machines and they are doing excellent work for us and we averaged during July, 26,800 brick, each, per day. In conclusion we will say that both the new tables and the new dies are so incomparably superior to the old ones that it gives us much pleasure to recommend them.

Very truly yours,
SEDDON & EDWARDS BRICK CO.

NEWELL IMPROVED CLAY PULVERIZER

We Guarantee the Material and Workmanship and allow a Trial of our Machine to any Responsible Party.



NEW 19-INCH LETTER C PULVERIZER, WITH HOPPER REMOVED.

Heavy Cold Rolled Shafts running in best Anti-Friction Metal Bearings, protected from dirt.

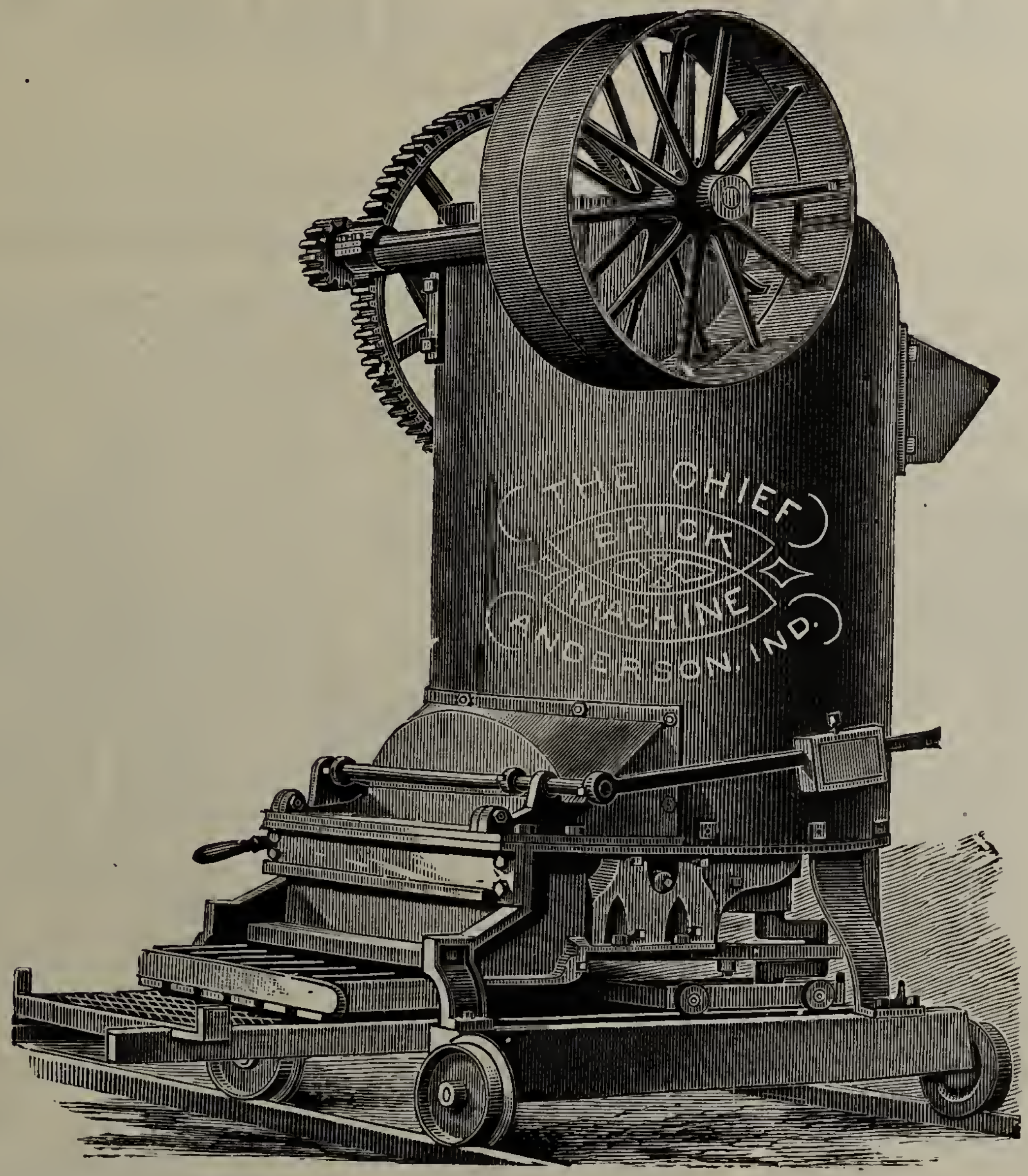
A FEW OF OUR CUSTOMERS AND REFERENCES:

Henry Maurer & Son, (3 Pulverizers) 420 E. 23rd St., New York City.
Peerless Brick Co., Philadelphia, Penn.
Perth Amboy Terra Cotta Co., (2 Pulverizers) Perth Amboy, N. J.
Syracuse Pressed Brick Co., Syracuse, New York.
Potomac Terra Cotta Co., (2 Pulverizers) Washington, D. C.
Siner & Brother, Frankford, Penn.
W. H. Perot, Baltimore, Md.
The Rathbun Co., Deseronto, Ontario, Canada.
Murrill Dobbins, (3 Pulverizers) Philadelphia, Penn.
American Brick & Tile Company, Phillipsburg, New Jersey.

Send for Illustrated Circular and Price List

NEWELL UNIVERSAL MILL CO., - 10 Barclay St., NEW YORK.

THE NEW IMPROVED
CHIEF BRICK MACHINE.



Patented Jan. 1, 1884, *April* 2, 1884, *and the new improvements of* 1887 *and* 1889.

Has taken the lead and stands at the head of all Brick Machines, and is now in operation in every State and Territory in the Union.

In its original construction it was exhibited and operated at the great Southern Exposition at Louisville, Ky.; also at St. Louis, Mo., Kansas City, Mo.; Indianapolis, Ind.; Columbus, O.; Cincinnati, O.; Chicago, Ill.; and at each and all places where premiums were awarded the CHIEF carried off the first prize medal over all competitors.

And with the late new improvements added the CHIEF stands in perfection, at the head of human inventions.

The NEW IMPROVED CHIEF is wonderful in operation, is all steel and iron, and of the greatest strength and durability, is easily operated, and with two horses or a small engine makes 60 to 100 perfect bricks per minute. Grinds, tempers and at the same time moulds into brick any clay. Stones in clay cannot break it, nor interfere with its free operation. It is easily transported, and changed from horse to steam power. It fills the moulds evenly and well until the machine is empty of clay, pressing each brick equally and solid, so all will shrink alike. The pressure can quickly be changed while the machine is running to suit the consistency of the clay. All shafts are of steel; main shaft runs in three boxes or bearings all outside of the machine into which mud or sand cannot penetrate. The wear can at all times be taken up so as to prevent leakage. The clay in the press box is under full control of the plunger, which is direct and positive, and prevents the mud from floating back into the mud drum; this feature is not found in any other mud machine.

Bricks made by the NEW IMPROVED CHIEF, are solid and perfect, and have sharp edges and corners, and do not crumble in burning.

The NEW IMPROVED CHIEF is equally suitable either for small or large yards, the best of bricks are made by it at the least labor and expense, all parts are easy of access and the bearings can be oiled from the outside. All ordinary sizes of brick as well as ornamental brick can be made on the NEW IMPROVED CHIEF and it is especially adapted to making fire brick of any shape.

The NEW IMPROVED CHIEF is sold on its merits, and warranted to be all that is claimed for it

We will send Circulars and Testimonials of the NEW IMPROVED CHIEF BRICK MACHINE, New Departure Tile Machine, Engines, Etc., Etc., free to any address on application. Address

Anderson Foundry & Machine Works,

[Mention the Clay-Worker.

Anderson, Indiana.

A. POTTS & CO.,

INDIANAPOLIS, INDIANA.

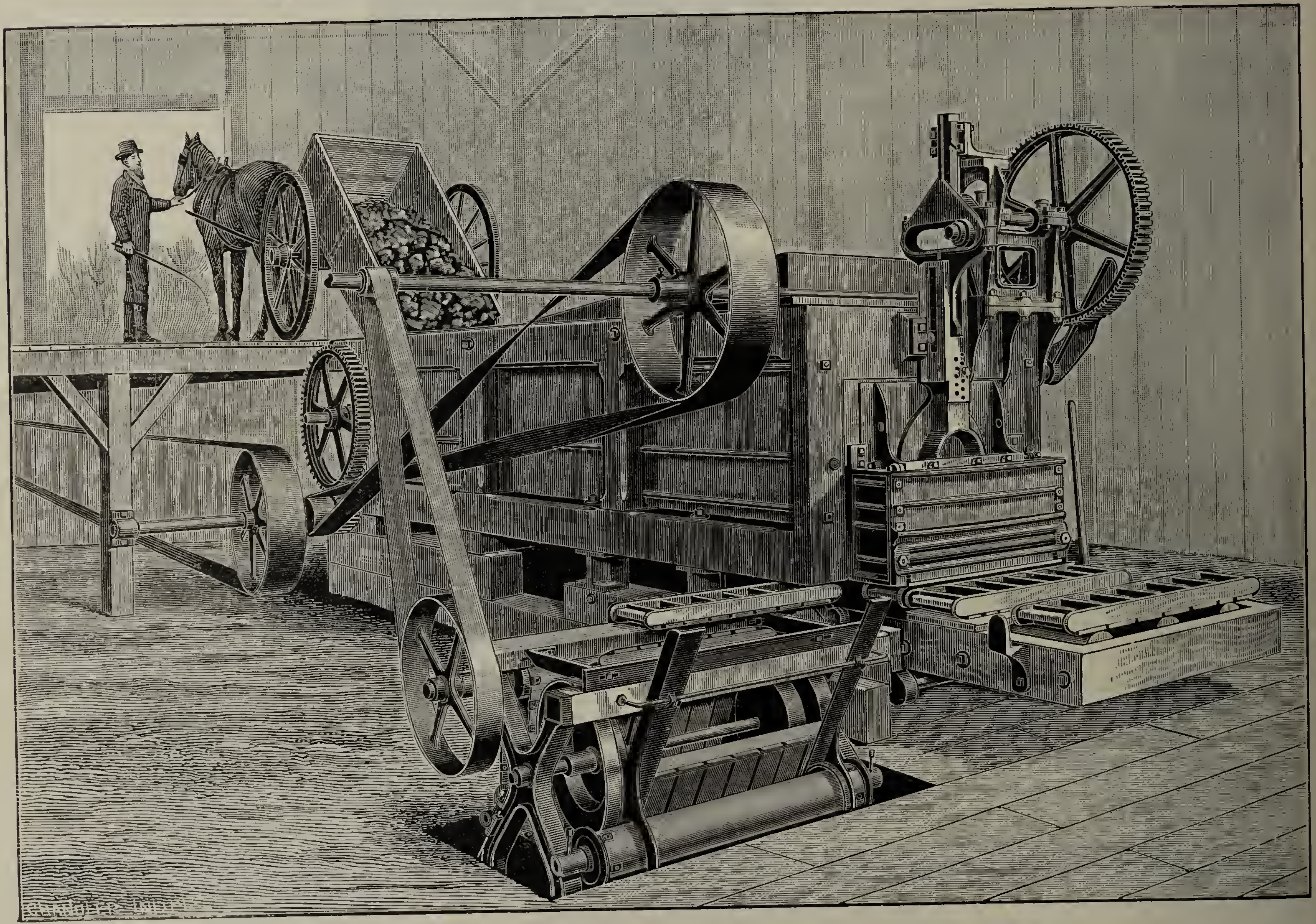
—MANUFACTURERS OF—

BRICK MAKING AND CLAY WORKING MACHINERY,

Including

Sand Mould Brick Machines, Pug Mills for Soft and Stiff Clay,
Mould Sanders, Disintegrators, Elevators, Kiln Castings and Yard Supplies

We are prepared to erect complete plants of any desired capacity.



OUR HORIZONTAL STOCK BRICK MACHINE AND MOULD SANDER

Is the best machine on the market for making sand moulded brick.
It is strong and powerful and will work the clay stiff enough to make the finest stock brick.
It works the clay direct from the bank not requiring extra Pug Mills as all vertical machines do.
It has no equal for Strength, Durability, Quantity and Quality of brick made.
It has no light complicated parts underneath machine, all parts being out where they can be kept clean.
Don't fail to write if in need of machinery in our line. Our prices are the lowest.
We shall be pleased to mail our complete descriptive circular.

ADDRESS

A. POTTS & CO., - - Indianapolis, Indiana.

THE ONLY ORIGINAL AND GENUINE

GRAND AUTOMATIC BRICK MACHINES

FOR STEAM OR HORSE-POWER.

* * *

SINGLE AND DOUBLE-GEARED HORIZONTAL PUG MILLS.

* * *

The most practical clay Disintegrator on the market—in sizes for any capacity. The Only Disintegrator that will take the clay direct from the bank In Any Condition and thoroughly disintegrate on a reasonable amount of power.

No Eccentrics. No Sprocket chains. Quickly adjusted to any degree of fineness. Examination readily shows the superior features of this machine which is fast making its own record.

* * *

We contract to equip complete Brickmaking plants under a positive guarantee to do as represented, claiming superiority in every detail and admit of no equal in the Particular line of First-class Brickmaking, that has proved both profitable to the manufacturer and entirely satisfactory to the consumer.

* * *

Address for all information and catalogue

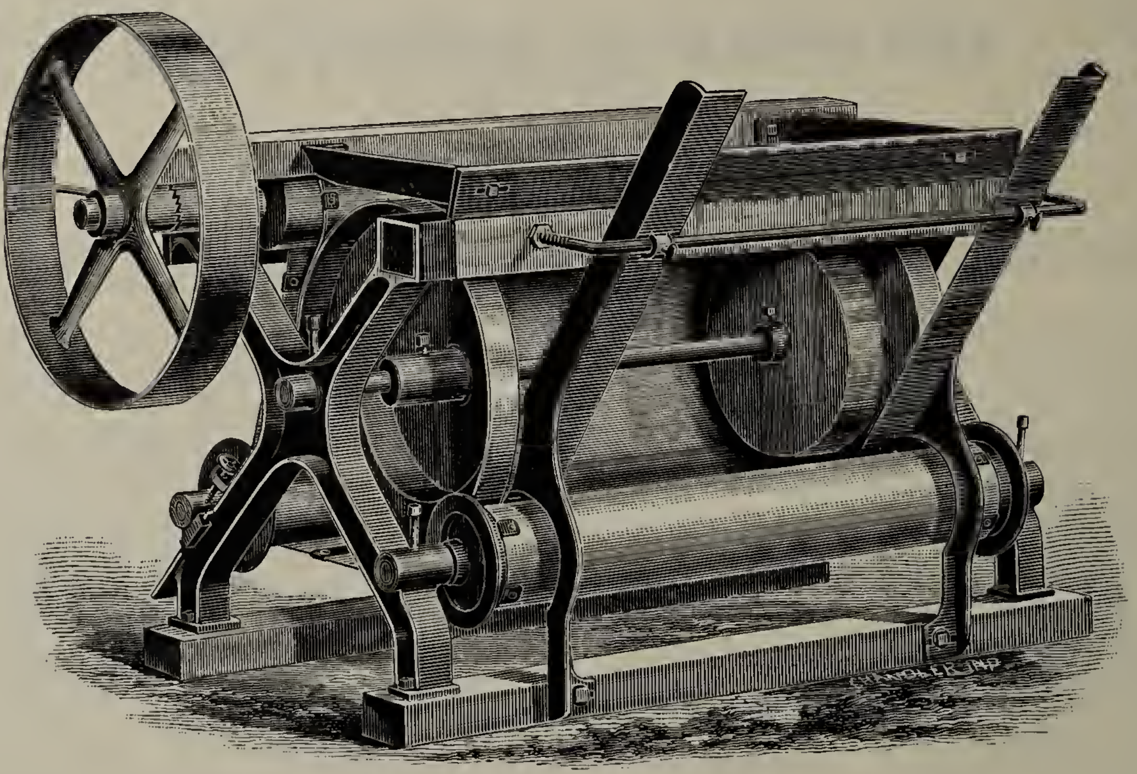
JONATHAN CREAGERS' SONS,

Mention the Clay-Worker.]

Cincinnati, Ohio.

AS USUAL

We are ahead again in Improved Machinery.



OUR MOULD SANDER

Has taken the lead, and is the only Perfect Mould Sander now on the market.

Our machine has no equal for Simplicity in Construction, Durability and Ease and Accuracy with which it does its work.

It sands the moulds perfectly, wastes no sand, and the moulds do not catch in feeding into machine causing delays.

Do not let other manufacturers scare you from using our machine. We do not blame them for getting mad and taking underhand ways of trying to keep the trade from using a machine superior to theirs.

All machines sent on trial and guaranteed to give entire satisfaction.

Prices lower than any.

We will be pleased to mail our Illustrated Circular on application.

C. & A. POTTS & CO.,

INDIANAPOLIS, - - INDIANA.

IMPORTANT to USERS of BRICK MOLD SANDING MACHINES.

TO THE PUBLIC:

Recent attempts by the owners of the Buck Patents on Brick Mold Sanding Machines, to frighten the trade and create a prejudice against the POTTS Machine, by notifying those using it that they are infringing said Buck Patents, require a statement of "the other side of the case." We can state our position in no better way than by publishing the following letters by our Attorneys, to A. H. Newton & Bros., and N. Kessler, of Helena, Montana, (one of the users of our machine who has been notified that it is an infringement on the Buck Patents). Our position is fully and exactly stated therein. The letters are copies, in substance of the originals.

A. H. Newton & Bros., Cohoes, N. Y.: INDIANAPOLIS, IND., April 1, 1889.

GENTLEMEN:—We address you concerning the controversy with our clients, C. & A. Potts & Co., over the Brick Mold Sanding Machine patents. Through your Attorney you are evidently endeavoring to create a false impression among the trade concerning the Potts' Machine. Besides a letter from him direct to our clients, others have, it seems, been sent to users of the Potts' Machine, to the effect that they are infringing the Buck patents. Such letters have been referred to us for answer, and our answers have doubtless been referred to you by your Attorney. However we are requested to write to you direct to the same purport as to him, in order that there may be no doubt that you have been notified of their position in the matter. The best way to do this will be to quote extracts from our letters to Mr. Stocking. In our letter to him of March 21st, replying to his of March 18th, to our clients, we said:

"We deny that the manufacture and sale of sanding machines under U. S. Patent No. 397,247 is an infringement of either patent to Buck named in your letter, (284,115, and 290,247).

"Our clients being satisfied of their right to operate under their patent, have no terms to offer, favors to ask or concessions to make. Even the statement that your people will proceed 'regardless of all necessary expense,' does not convince our clients that they must surrender rights to which they believe their title is perfect. They expect to stand by their rights all the time and under all circumstances. This is sufficient to enable your clients to see the position of our company. They must proceed as they see fit."

In answer to your Attorney's letter of the 18th of March to Mr. Kessler, of Helena, Montana, we said:

"In regard to this matter, we have only this to add to our letter of the 21st inst. to you, on the same subject: If your clients are anxious to have this controversy settled in Court, we will extend to you any aid possible in getting the questions involved to a speedy issue. If you think you have a good case no reason exists for further delay or attempts to frighten the trade. Our clients are ready to have the issue made immediately. They have information that your clients are also notifying the trade that they have already brought suit against our clients for infringement of the Buck patent. You are notified that they will be held strictly accountable for all such, or any other misrepresentations of fact."

You will see from the foregoing that C. & A. Potts & Co. is quite ready to go ahead with any suit you may see fit to bring, and also propose to make you responsible for all damages to their trade, arising from false reports and misrepresentations of fact circulated by or through you. Our clients are ready to deal honorably and squrely with everybody, and to defend their rights when assailed, to any extent made necessary, cost what it may.

Yours very truly,

C. & E. W. BRADFORD, Attorneys for C. & A. POTTS & CO.

N. Kessler, Esq., Helena, Montana: INDIANAPOLIS, IND., March 30, 1889.

DEAR SIR:—Our clients, C. & A. Potts Co., of this city, have handed us the letter of the Attorney for A. H. Newton & Bros., which was sent by them by you for answer. They received a letter from the same party and to substantially the same purport, only a few days ago, which they referred to us for answer. A careful investigation shows the claims of the Newtons and their Attorney to be absolutely groundless. The Potts' machine does not infringe the Patents which belong to this company. Our clients are prepared to defend any and all suits brought and are perfectly willing to have the question settled in Court. You will pay no attention to any threats or bluffs from these people, but rest assured that you will be protected in the use of the Potts' machine. If any further movements are made by them inform us, or our clients promptly, and the matter will receive immediate attention.

Yours very truly,

C. & E. W. BRADFORD, Attorneys for C. & A. POTTS & CO.

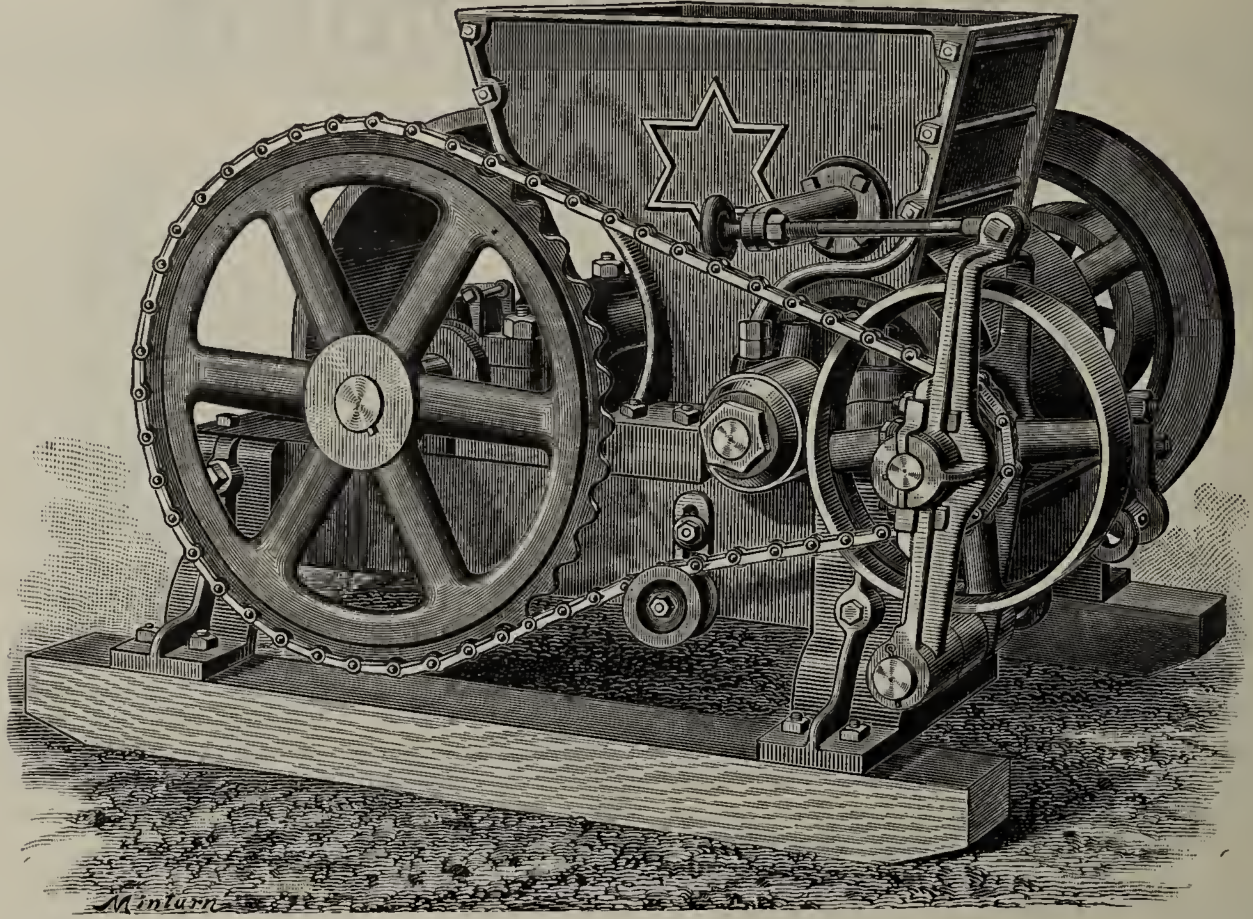
It will be seen by the foregoing that we propose to stand between the users of our machines and the threatened infringement suits whether the threats mean bluff or business. All users of our machines are requested to inform us promptly of any move of A. H. Newton & Bros. tending to injure our rights or create a prejudice against our machine. We have put our machine on the market only after a careful investigation to ascertain exactly what our rights are in the premises, and, being fully satisfied of our rights, we are prepared to stand by them. Our patent is No. 397,247, of Feb. 5, 1889.

C. & A. POTTS & CO.,

April, 1889.

INDIANAPOLIS, INDIANA.

C. & A. POTTS & CO.



Still in the Lead and Without a Rival.

THE POTTS' DISINTEGRATOR has stood the test of seven years, and is acknowledged by all Brickmakers to be the only machine which will prepare clay for brick.

It does not have a patent clod breaker or other complicated machinery, which is liable to break or cause delays.

It will pulverize all lumps or clods, either wet or dry. It will not choke as roller crushers do, everything put in it is ground. It does not require a man to break the clods or stamp the clay as in rollers.

No Brick Manufacturer can afford to be without this machine.

It is invaluable in any Brick Yard where **stony, lumpy,** or **tough** clay is worked.

No more cracked brick.

No more hard dry lumps in brick.

No gear to rattle or break.

No rolls to wear and be replaced each season.

We manufacture a full line of Yard Supplies, Brick Machines, Pug Mills, Elevators, Kiln Castings, Iron Dry Cars, Trucks and Barrows.

C. & A. POTTS & CO.,
INDIANAPOLIS, INDIANA.

[Mention the Clay-Worker.]

A WARNING.

Jonathan Creagers' Sons, of Cincinnati, are now manufacturing a Disintegrator which is an infringement on our patents. We hereby give notice that we shall protect said patents, and all persons using these machines are liable for damages.

C. & A. POTTS & CO.

J. & H. M. Creager, Cincinnati, O.:

GENTLEMEN:—On behalf of our clients, C. & A. Potts & Co., of this city, and by their instructions, we hereby notify you that you are infringing their patents on Clay Disintegrators, No. 322,393, No. 368,898, and No. 384,278, and that you must desist or prepare to defend a suit for infringement. Our clients are of the belief that you are already aware of the fact that you are infringing their patents, and that it is a willful infringement. Under such circumstances you must understand that no mercy will be shown in this matter. You must quit and withdraw your machines from the market or take the consequences.

Yours very truly,
C. & E. W. BRADFORD, Attorneys for C. & A. POTTS & CO.

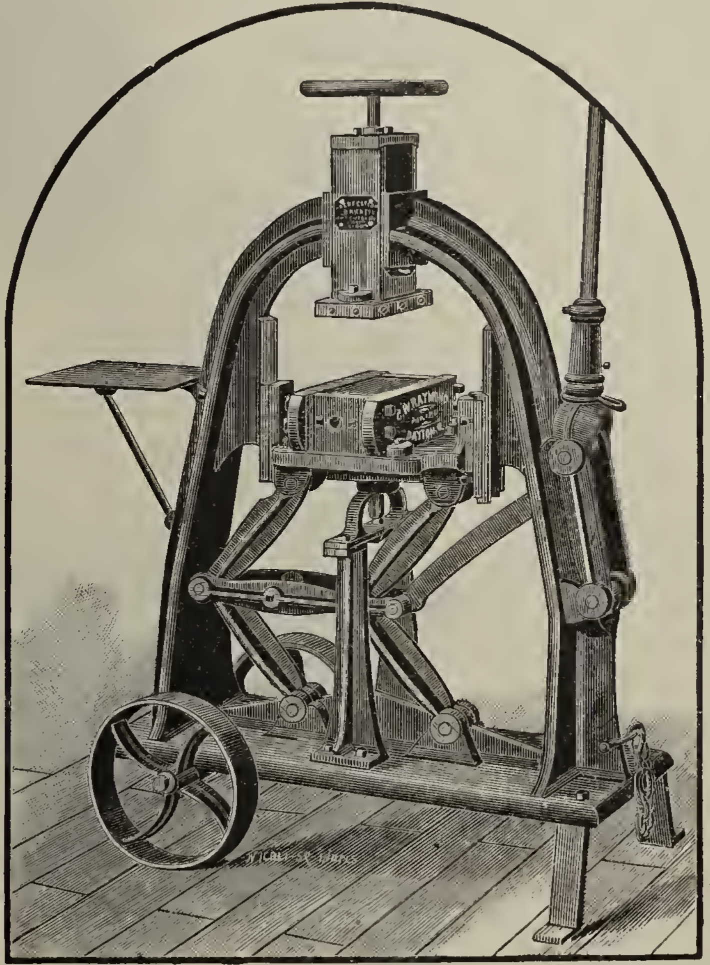
RAYMOND'S

PERFECTION BRICK PRESS.

(NO. 1 FOR RED BRICK. NO. 2 FOR FIRE BRICK.)

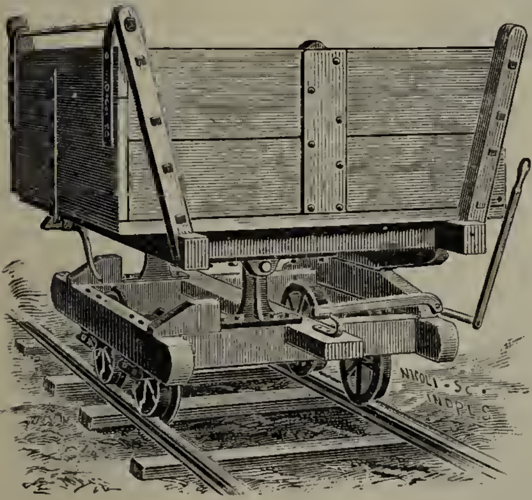
SIMPLE, POWERFUL.

Its whole action is derived from a short, easy, but powerful movement of one lever. A Perfect press which turns out perfect work.



——MANUFACTURERS OF——

AUTOMATIC DUMPING CARS,



For Brick Yards, Gravel Pits, Plantations, Mines, Etc.

SAVES TIME.

SAVES LABOR,

SAVES MONEY.

Write for Illustrated Catalogue giving full description.

RAYMOND'S **WROUGHT IRON**

TEMPERING WHEEL

Will temper mud for 30,000 to 40,000 bricks per day. Is ten times more durable, Tempers faster, and mixes better, with one third less draft than any wheel made.

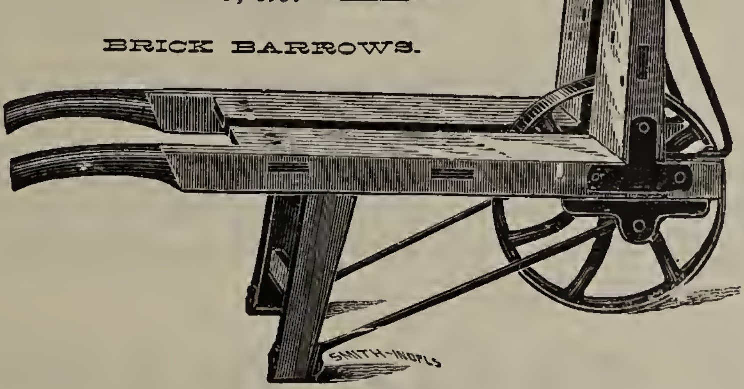
RAYMOND'S SELF REVERSING WROUGHT IRON TEMPERING WHEEL

Pat'd May 18, 1880.

Improved Dumping Beds,
Horse Powers,
Spring Trucks,
Wheel-Barrows For Brick and Tile
Brick Moulds,
Kiln Arches,
Grate Bars, &c.

Send for CIRCULAR.

BRICK BARROWS.



Our Barrows are made from the best of seasoned white-oak, braced in front and cross braces underneath; iron wheel and axle and three coats of paint; the frame is morticed throughout. They will stand the rough usage of the brick yard. For strength and durability they have no equal.

BRICK MACHINE MOLDS.

We manufacture a great number and variety of molds and with improved machinery, we are able to fill orders with dispatch. Our molds are made of the best of cherry wood

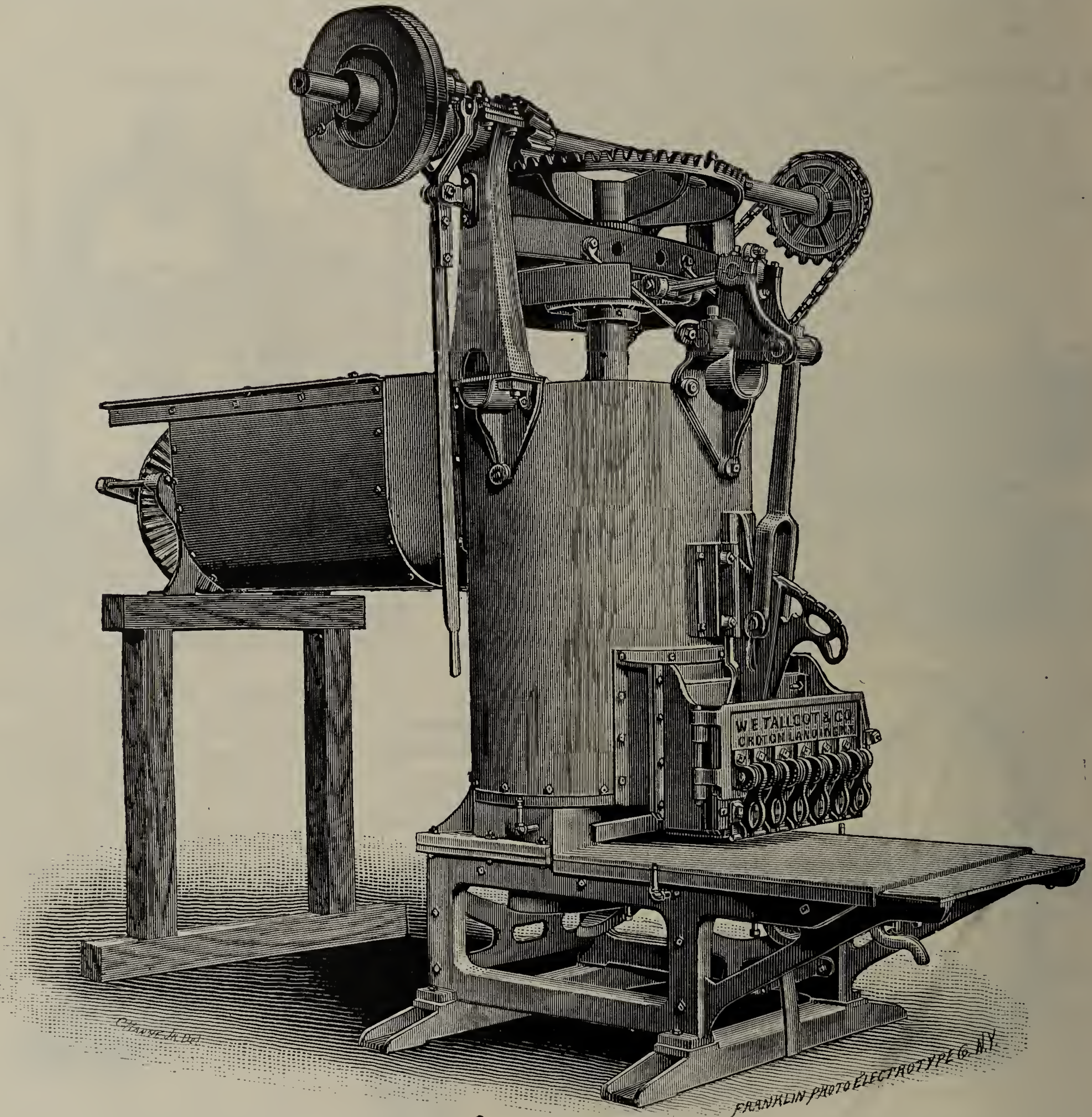
with side pieces gained for partitions and each partition is in turn dove-tailed into the sides. **They are thoroughly iron bound.** The cross-irons being dove-tailed. Without doubt, the most substantial mold made.

C. W. RAYMOND & CO.,

7 & 11 WAYNE STREET, (Mention Clay Worker.) DAYTON, OHIO.

W. E. TALLCOT & CO'S.

I. X. L. Brick Machine and Improved Pug Mill.


W E TALLCOT & CO.
CROTON LANDING N.Y.
FRANKLIN PHOTO ELECTROTYPE Co. N.Y.

This is a simple and powerful machine, making a superior brick and possessing advantages over all others. It is the result of years of experience in using and manufacturing brick machines. Among its advantages are *Great Strength, Simplicity and Durability* few parts, well protected from sand, yet easy of access for adjustment, renewal and repair. No wood is used in its construction; it is made all of iron and steel. Perfect automatic action to prevent breakage by stones or other obstructions. Great tempering capacity and ability to mould very stiff clay. It is easily understood, easily operated, easily kept in order. Quality of brick made, unsurpassed

The I. X. L. is eipecially designed and built for heavy work. Weight of Machine and Pug Mill 10,000 pounds. Weight of Machine without Pug Mill, 7500 pounds. Send for circular and prices.

It will pay you to use the I. X. L.

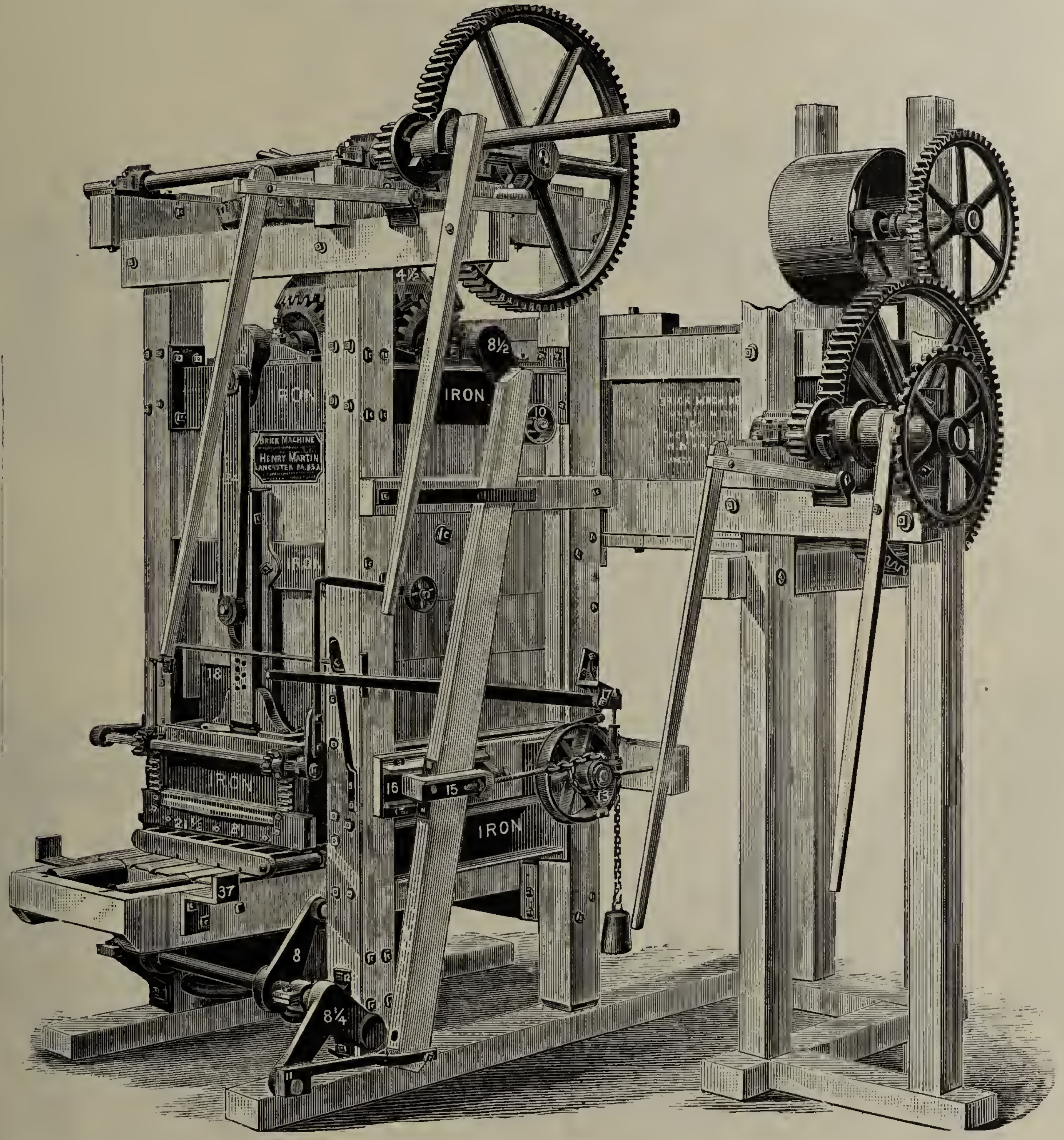
W. E. TALLCOT & CO.,

Croton Landing. New York

The Henry Martin Brick Machine.

For Steam or Horse-Power.

FOR STEAM OR HORSE-POWER.



FOR STEAM OR HORSE-POWER.

This cut represents our Steam-Power Machine and Pug Mill combined. It is the strongest. It is the best. It is the most simple. It is the most perfect. It does the best work. It works any clay. It does not get out of order. It is not liable to break down. It stands hard usage. It can be changed to Steam Power.

BETTER THAN EVER.

Our machines are this season the Best ever built by our Mr. Henry Martin, whose thirty years' experience as rendered him familiar with the wants of the Trade.

For Strength, Durability, Qantity of Output and Quality of Work, they have no equal.

Brickmakers make no mistake when they buy the Henry Martin Machine.

MANUFACTURED BY

The Henry Martin Brick Machine Mfg. Co.,

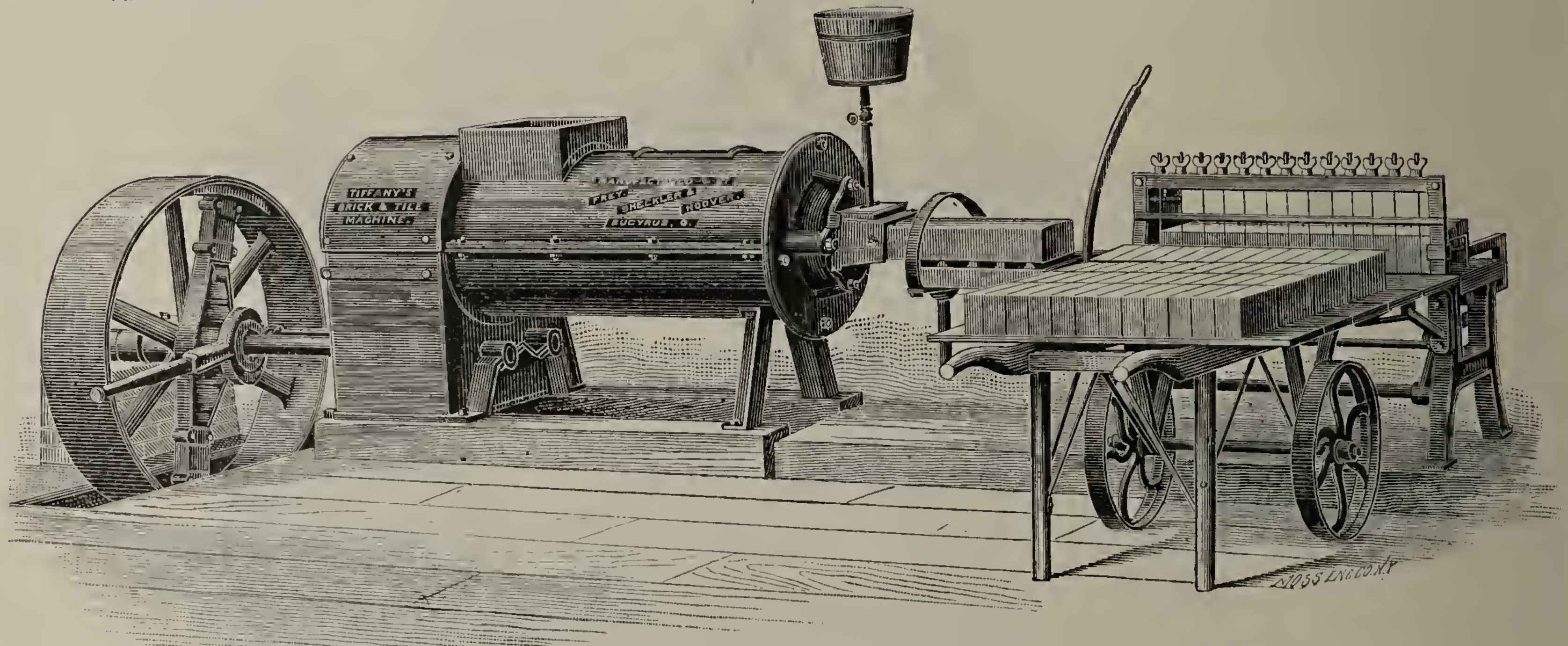
Send for a Catalogue. LANCASTER, PA., U. S. A.

THE FREY, SHECKLER CO.

BUCYRUS, OHIO.

With increased facilities threefold.

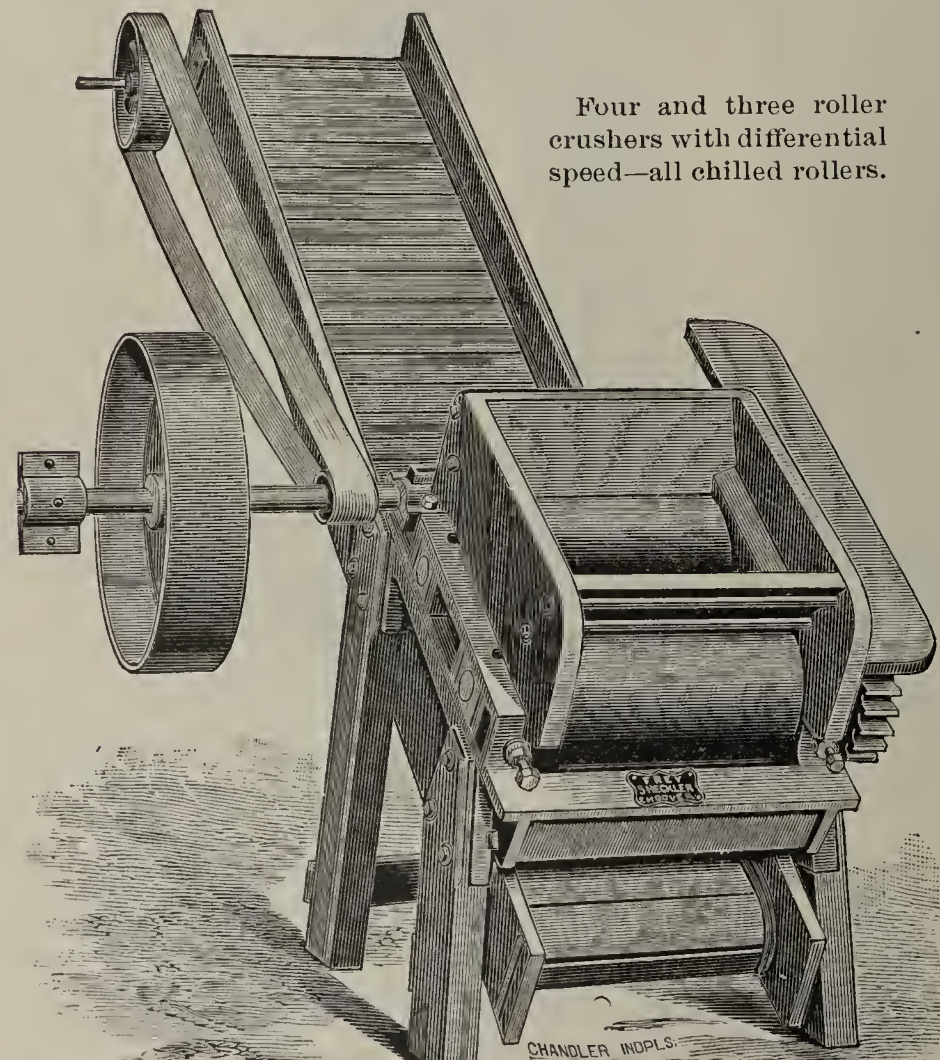
Seven different brick machines. Four different til machines. Will make any quantity of brick or tile as desired.


TIFFANY'S BRICK & TILE MACHINE.
FREY SHECKLER & HOOVER BUCYRUS O.

The Mascot for light power and low in price.

CUT OF CENTENNIAL WITH SELF-LOADING ATTACHMENT ON CUTTING TABLE.

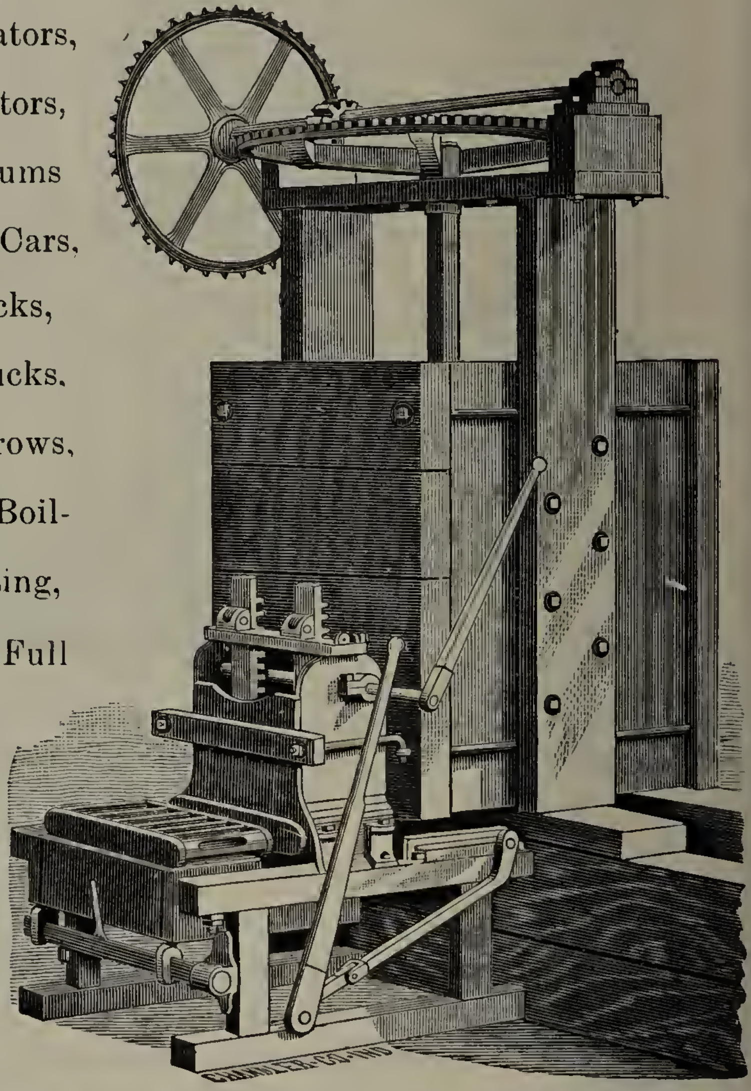
The above cut shows the Board Delivery Cutting Table which loads the brick automatically on special trucks in connection with the Centennial Tiffany Machine and Patent Lubricating Brick Die. Acme Special Brick Machine, largest capacity. The Duplex, 80,000 brick per day.


CHANDLER INDPLS.

Four and three roller crushers with differential speed—all chilled rollers.

We make thirteen different patterns of Roller Clay Crushers. All rollers best chilled iron.

Clay Elevators, Tile Elevators, Steam Drums and Dump Cars, Tile Trucks, Brick Trucks, Wheelbarrows, Engines, Boilers, Shafting, Pulleys. Full outfits for Brick and Tile Factories and Fire Clay Works.



The Eagle Brick Machine.

Cheapest and Simplest for Horse and Steam power

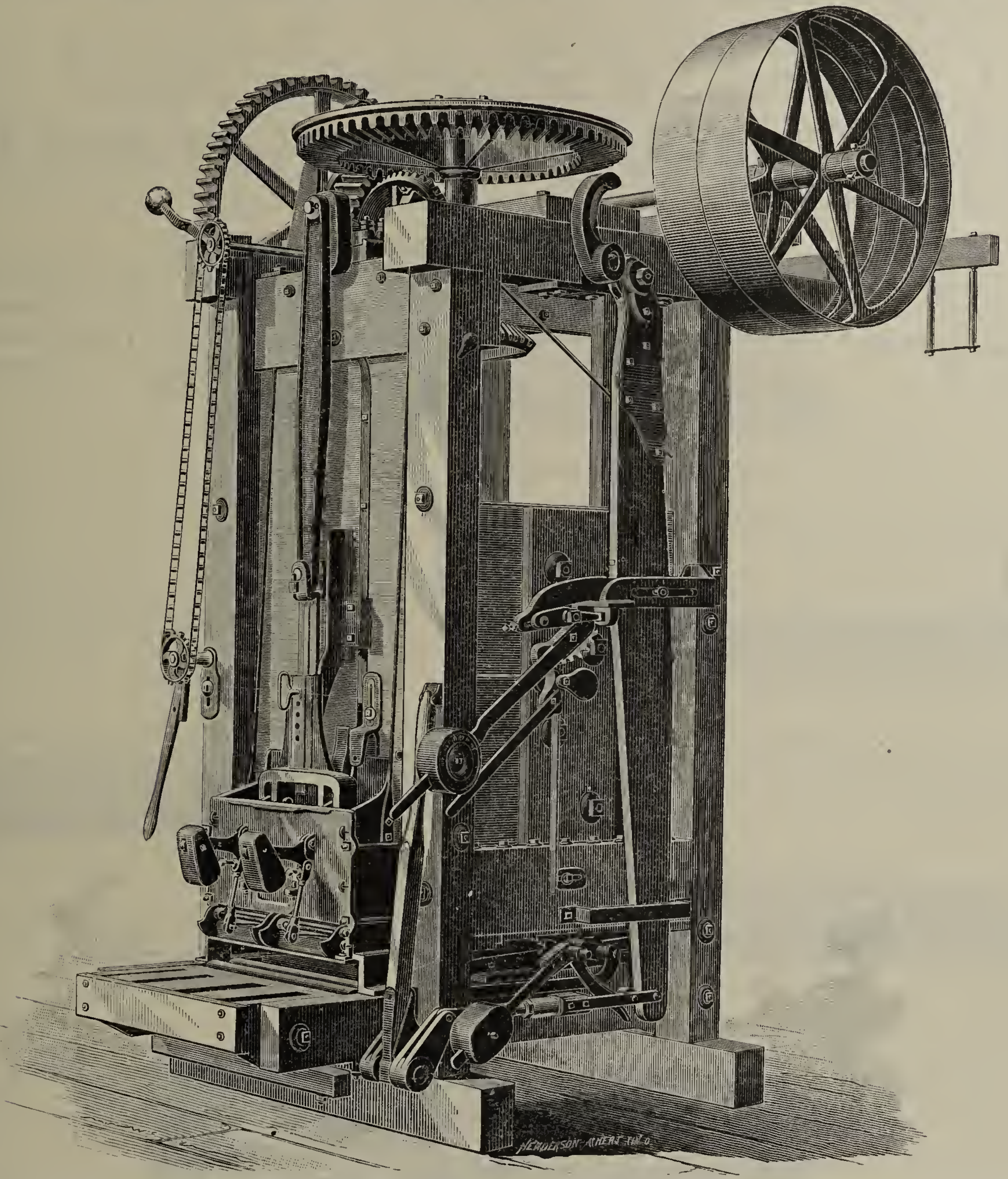
(16,000 brick per day.)

PLANS FOR KILNS FURNISHED CUSTOMERS.

Send for illustrated circulars to

The FREY, SHECKLER CO., Bucyrus, Ohio.

The "Tiffin" AUTOMATIC Brick Machine



The "Tiffin" **Automatic** Brick Machine is, **beyond question**, the best machine of its class in the market. It is **Heavy, Strong** and **Durable. IT IS GUARANTEED TO DO GOOD WORK.**

The **"TIFFIN"** is made for use by **Steam,** or **Horse** power. The capacity of the **Horse Power Machine** is 18,000 to 20,000 per day, and of the **Steam Power** 25,000 to 40,000 per day, according to the speed at which they are operated.

Both styles are equipped with our **Automatic "Stone Doors,"** which permits a stone, or any other hard substance, that may have passed in with the clay, to pass out **without breakage to the Machine.**

PRICES:
Steam Power Machine - - $350.00
Horse Power Machine - $250.00

The principal shafts are of Steel, and all other material used, is **First Class. Competent Workmen Only Employed** in their construction. These machines have been **Thoroughly Tested** in the hands of **Experienced Brickmakers** during the past season, and with the most **Satisfactory** results to them. Parties who may be **Interested Enough** to wish to make inquiry, will be given the names and address of the parties who have had them in use.

We are the makers of the **CELEBRATED "OLD RELIABLE"** Brick Machine, for use by hand power, which is so well and favorably known to the Brickmakers of the entire country. We are also manufacturers of Turn Tables, Trucks, Wheel Barrows, Molds, Kiln Doors, Etc., Etc. Correspondence solicited.

TIFFIN AGRICULTURAL WORKS,

[Mention the Clay-Worker.] **TIFFIN, OHIO.**

CHAMBERS BROTHERS CO.,

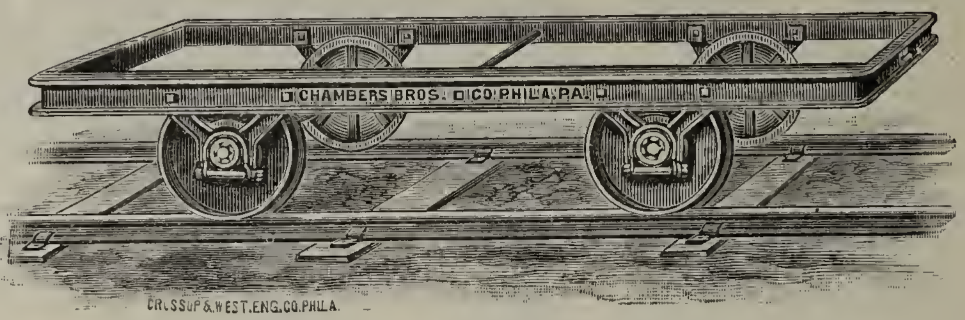
FIFTY-SECOND ST., BELOW LANCASTER AVE,

PHILADELPHIA, PA.

Improved Tunnel Dryers For Common Brick

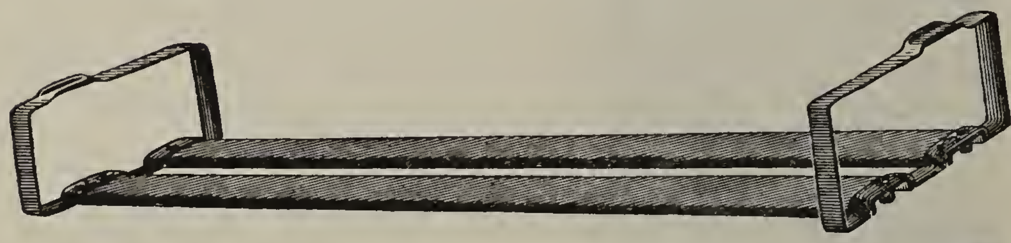
And the Most Durable and Complete System for Transporting Green Brick.

The Strongest Car Made.


CHAMBERS BROS. CO. PHILA. PA.
CROSSCUP & WEST. ENG. CO. PHILA.

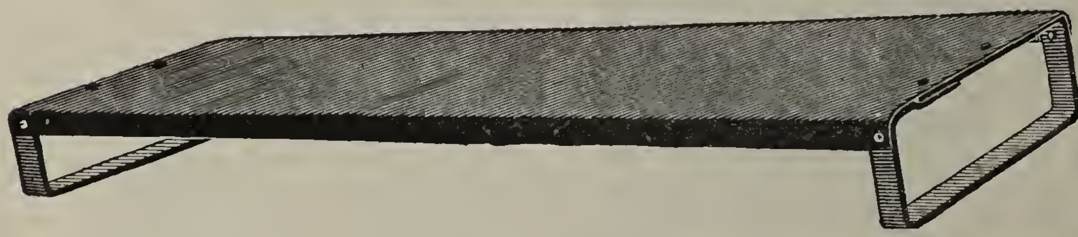
The Strongest Car Made.

CHAMBERS' WROUGHT-BODY DRYER CAR.
A lower priced Car with cast iron bodies made to order.

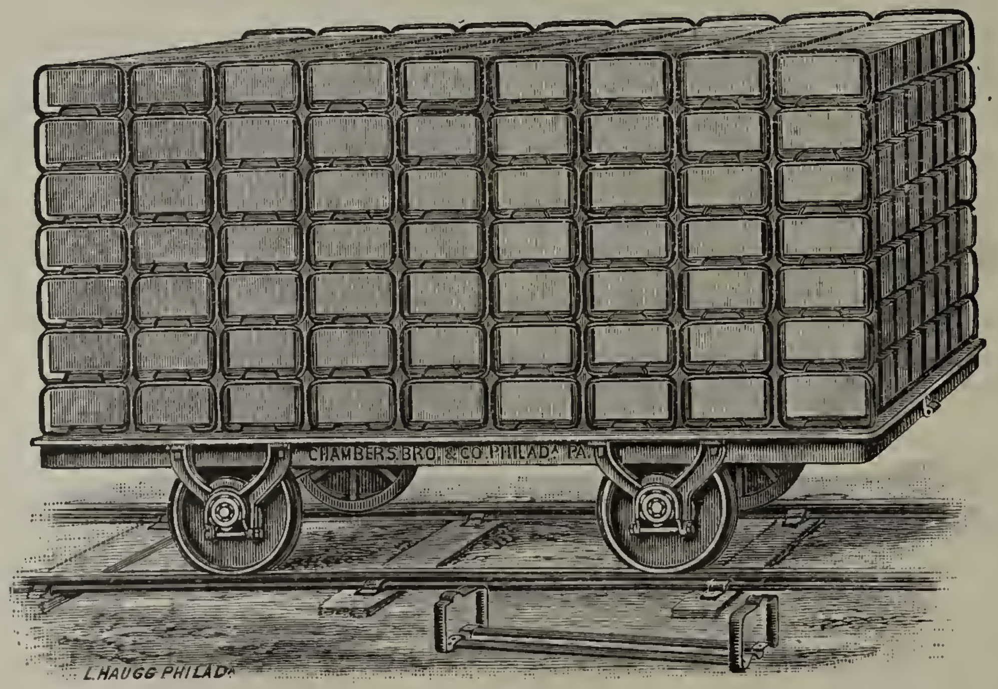


☞ Wrought Iron Interlocking Pallet for Stiff Tempered Brick only.

Steel Pallet for brick placed on flat side or on edge. ☞



☞ Steel Pallet for soft moulded brick, or those placed on flat side only.


CHAMBERS BRO. & CO. PHILADA. PA.
L. HAUGG PHILADA.

CHAMBERS BROTHERS COMPANY,

PHILADELPHIA, - - PA.

☞See ad. on front cover page.

[Mention the Clay-Worker.]

MORRISON'S IMPROVED KILN

FOR -:- BURNING -:- CLAY -:- WARES

Especially adapted to Burning Common, Repressed and Ornamental Brick.

PATENTED IN UNITED STATES AND CANADA.

SUCCESSFUL! DURABLE!

Daily product of our Kilns in the United States, One-Half Million Bricks. Our claims fully substantiated BY OUR PATRONS. We claim ninety to ninety-five per cent. hard brick. Arch bricks all Fronts and Pavers and none damaged—of uniform color. Pressed brick burned without fire-marks—coal screenings preferred for fuel. One fireman for two hundred thousand bricks. The

Only Kiln That Regulates the Temperature of Heat

And directs its course by a system of air drafts, giving complete control of the degree of heat, as well as its manipulation. This system we have covered by letters patent. Any persons using these air drafts are liable to prosecution for infringement.

Read the following testimonial from a recent patron, and another new one from an old patron:

Knoxville, Tenn., October 31st, 1888.

R. B. Morrison, & Co., Rome, Ga.:

GENTLEMEN—I have used your *Improved Kilns* during the past twelve months and cheerfully report the result. We burn our bricks in your Kiln at a cost of sixty-five cents per thousand for fuel and labor; a saving to us, over our old method, of eighty cents per thousand on the two items. My saving in waste brick in the kiln and at the building is fully *ten per cent.*, or sixty cents per thousand in other words Every time I burn your kiln of 300,000 bricks it is a saving to me of *more than four hundred dollars* over the old process. I find your kiln durable and simple to operate. We use coal screenings for fuel. Have no waste in arches, and burn ninety per cent. hard brick. I have no hesitation in pronouncing your kiln a success in every respect, as you make no claims it does not fulfill.

Yours Truly,

REPS. JONES.

Atlanta, Ga., July 20th, 1888.

R. B. Morrison & Co., Rome, Ga.:

GENTLEMEN—We have used your Improved Kilns for three years and during that time have burned upward of a hundred millions in them and wish to emphasize our former statement in regard to your kilns. They are reliable, durable, and the best kilns for our purpose, we have been able to find after investigating many of the various kilns in use, and say to our friends of the trade: If you want kilns that will burn your brick nearly all hard. and do it every time, burn them economically and without loss, and with little cost for repairs, secure the Morrison Kiln.

CHATTAHOOCHEE BRICK CO., per GEO. W. PARROT, Vice-Pres.

—WE SELL OUR KILN STRICTLY ON MERIT—

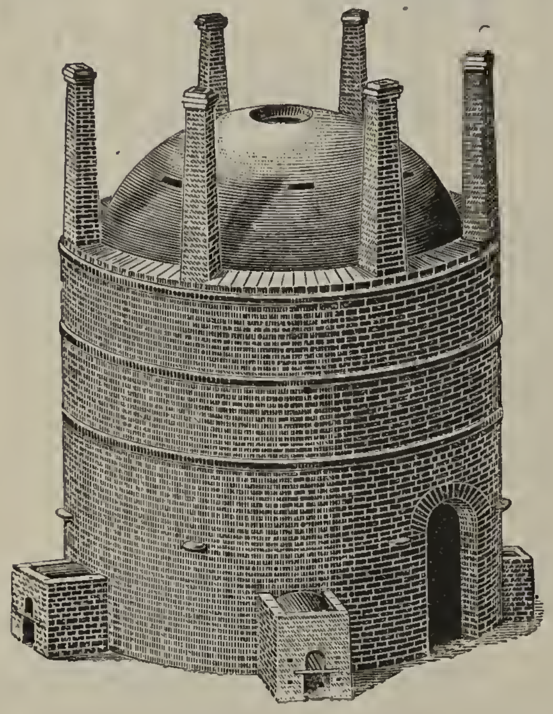
☛ For descriptive circulars, additional testimonials, and all information desired, address

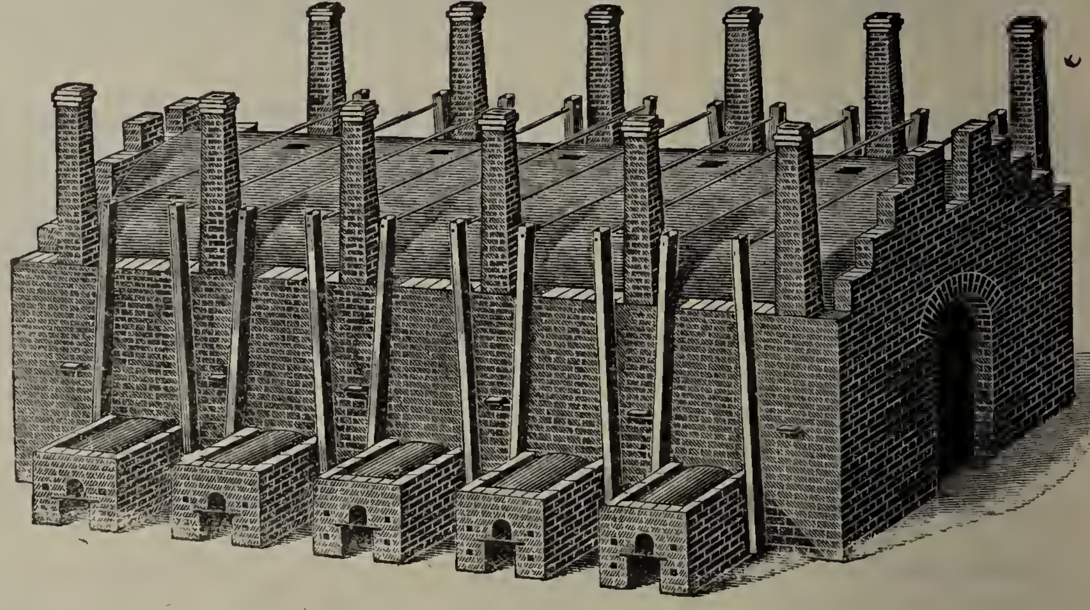
R B. MORRISON & CO.,

Box 335, - - - - ROME, GEORGIA.

THE EUDALY KILN.

BURNS ANY KIND OF CLAY OR WARE.





THE DOWN-DRAFT KILN.

UNIFORMITY IN BURNING is without a doubt the most essential feature to clay workers. Especially is this the case with fine clays where it is desired to have the wares of uniform color, size and hardness.

In the construction of these kilns particular attention has been paid to this point, by having first carefully examined the subject of drafts and the strength and nature of the different kinds of fuel. The size of the kiln, the size and number of furnaces, flues and chimneys must always sustain the proper relation to each other for a perfect draft. Too much draft is as dangerous as too little. One of the greatest mistakes of kiln inventors and builders is that they utterly disregard the important subject of drafts.

ABILITY TO DIRECT THE HEAT TO ANY PART OF THE KILN is equally as important as a proper draft. Unless the burner has control of the heat in the kiln he has no assurance of a uniform burn. In these kilns if the burner finds the wares too hot in any portion of the kiln he can in a moment shift the heat to any other part where it is not so hot, or what is better, if he has two or more kinds of wares in the kiln, one of which requires more burning than another, he can easily give that portion of the kiln an extra amount of heat. We claim that this is the only kiln in which these results can be attained successfully.

For this reason wares can be burned by this system **more uniformly** than by any other.

Practically there is no difference from top to bottom, yet this is purely a *down draft* kiln. There are no inside dampers or cut-offs. **Everything about the kiln is permanently built.**

ECONOMY OF FUEL AND LABOR is perhaps the second most important feature of any kiln. We hear a great deal said about "economy in fuel and labor," but to understand what is necessary to a fuel and labor saving kiln one should be thoroughly acquainted with all kinds of fuel and the conditions necessary to get the greatest number of heat units out of it, and at the same time **distribute the heat to the burning wares in the most effective manner.**

We claim that our latest improved furnace is the most **complete economizer** of fuel that has ever been invented.

The construction is purely scientific, and is made by first obtaining the chemical requisites necessary to insure perfect combustion and then building a furnace to bring about these results. Different kinds of fuel require a different size and construction of furnace. We use any kind of fuel, soft coal, screenings, oil, gas or wood.

COST OF CONSTRUCTION.—These kilns require no large stack, which ordinarily costs as much as the kiln proper. Many persons think they must have a large, tall stack in order to have sufficient draft to get the bottom of the kiln burned.

This is certainly a mistaken notion.

The things that are required, however, are a correct location and size of furnaces, flues and chimneys with reference to each other and the kiln. When these are properly attained the burner need have no fear about draft.

In these kilns great care has been taken to adjust these relations in such a way that the expensive stack is not at all required, and a much better draft obtained.

DURABILITY.—Each part of these kilns is built with special reference to strength and durability.

The furnaces, which are perhaps the most perishable parts of any kiln, are in these kilns made very strong and durable.

Those parts most liable to burn out can be easily removed and replaced without damage to the other parts of the furnace.

Rules are given by which a builder of these kilns can get the strongest crown and best supports to the kiln.

SIZES.—These kilns can be built either **round** or **square,** and of **any** desired **size.** A number of these kilns are now in use that burn from **150** to **250** thousand bricks at a time. The walls are built **twenty-four inches thick.** They should be lined throughout with fire-brick where the clay is very hard to burn. Good kilns can be made, however, without using fire-brick for any part except the **furnaces** and **bags.** In asking for cost of construction **state size of kiln in feet wanted,** whether the kiln walls, crown or bottom are any or all to be lined with fire-brick.

DRAWINGS and specifications for building kilns will be furnished any who purchase *kiln or yard rights.* We usually can furnish a man to superintend the building if desired.

For further information address

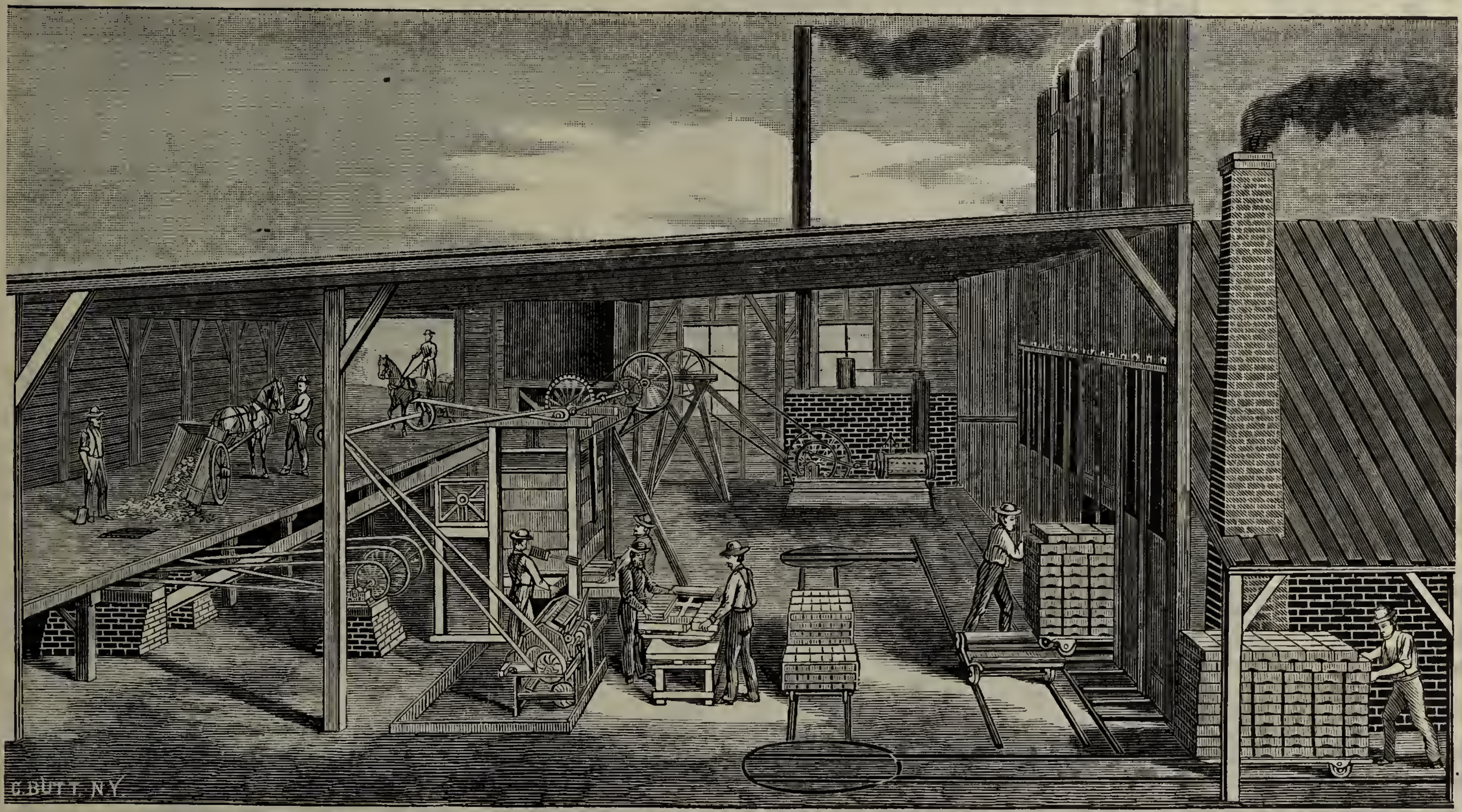
W. A. EUDALY,

64 Johnston's Building, - - - - CINCINNATI, OHIO.

SHARER'S IMPROVED DRYER

☞ More than one hundred now in use **DRYING SUCCESSFULLY** Soft Mud Brick, Stiff Mud Brick, Pressed Brick, Fire Brick, Hollow Brick, Tile, Plaster, Architectural Terra Cotta, Terra Cotta Lumber, Peat and Lumber. ☜

No other Dryer in existence can successfully dry such a variety of Materials.



23 are now in process of Construction and under contract to be built this Spring.

The Only Successful Soft Mud Brick Dryer in Existence.

Will also dry Stiff Mud, Semi-Dry and Pressed Bricks at 50 per cent. less cost than any Steam Drier.

No other Dryer will Guarantee to dry Soft Mud Brick. I Guarantee to dry any kind of Bricks.

It is not a Direct Heat Dryer, nor a Steam Heat Dryer. It is a Radiated Heat Dryer. The heat being produced from Coal, Wood, Coke, Oil, Gas or any kind of Fuel, and Radiated through Brick or Metal floor. The heat can be so graduated as to successfully dry the most Tender or Refractory Clays without damage. While in a Direct Heat Drier the product of combustion coming directly in contact with the material to be dried will warp, check and crack in most cases. In a Steam Drier the heat cannot be graduated. Neither can heat be produced from Steam near as cheaply as from the Fuel Direct. With a Steam Dryer it is necessary to run one or more Boilers and Exhaust Fans day and night. There is No Machinery whatever necessary to operate my Dryer. Hence the wear and tear and expense of operating is reduced to the minimum.

References and all information given by letter or otherwise. Address,

GEORGE W. SHARER, Proprietor,

ED. H. CALLAWAY, Gen'l Agt., 72 Redde St., New York.
E. A. KING, Special Agt. New England States, 48 Congress St., Boston, Mass.
HUGH CAMERON, Toronto, Ont., Special Agt. Dominion of Canada.

TERRE HAUTE, INDIANA.

Improved Eureka Dry Press Brick Machine.

WEIGHT SEVENTEEN TONS.

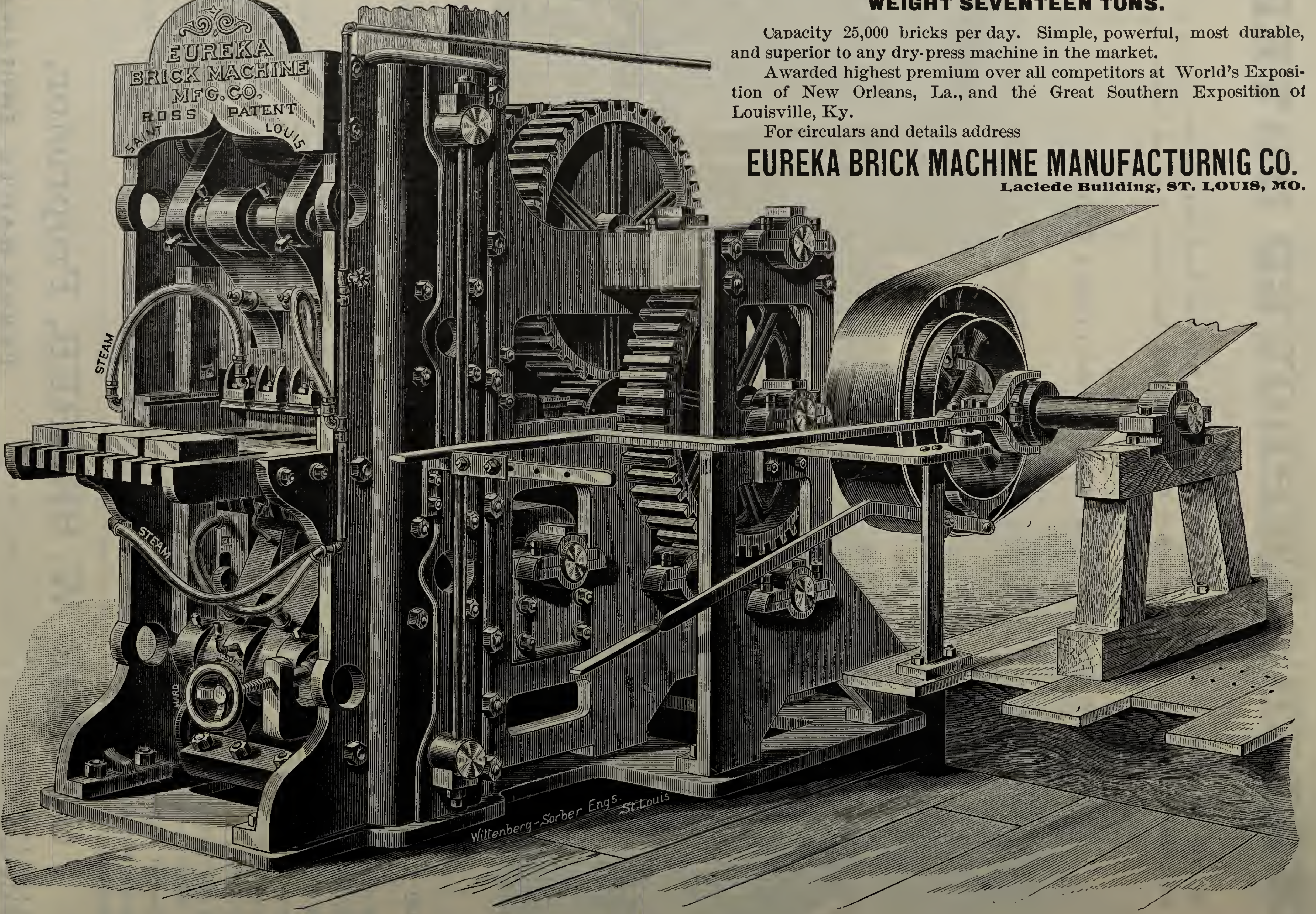
Capacity 25,000 bricks per day. Simple, powerful, most durable, and superior to any dry-press machine in the market.

Awarded highest premium over all competitors at World's Exposition of New Orleans, La., and the Great Southern Exposition of Louisville, Ky.

For circulars and details address

EUREKA BRICK MACHINE MANUFACTURNIG CO.

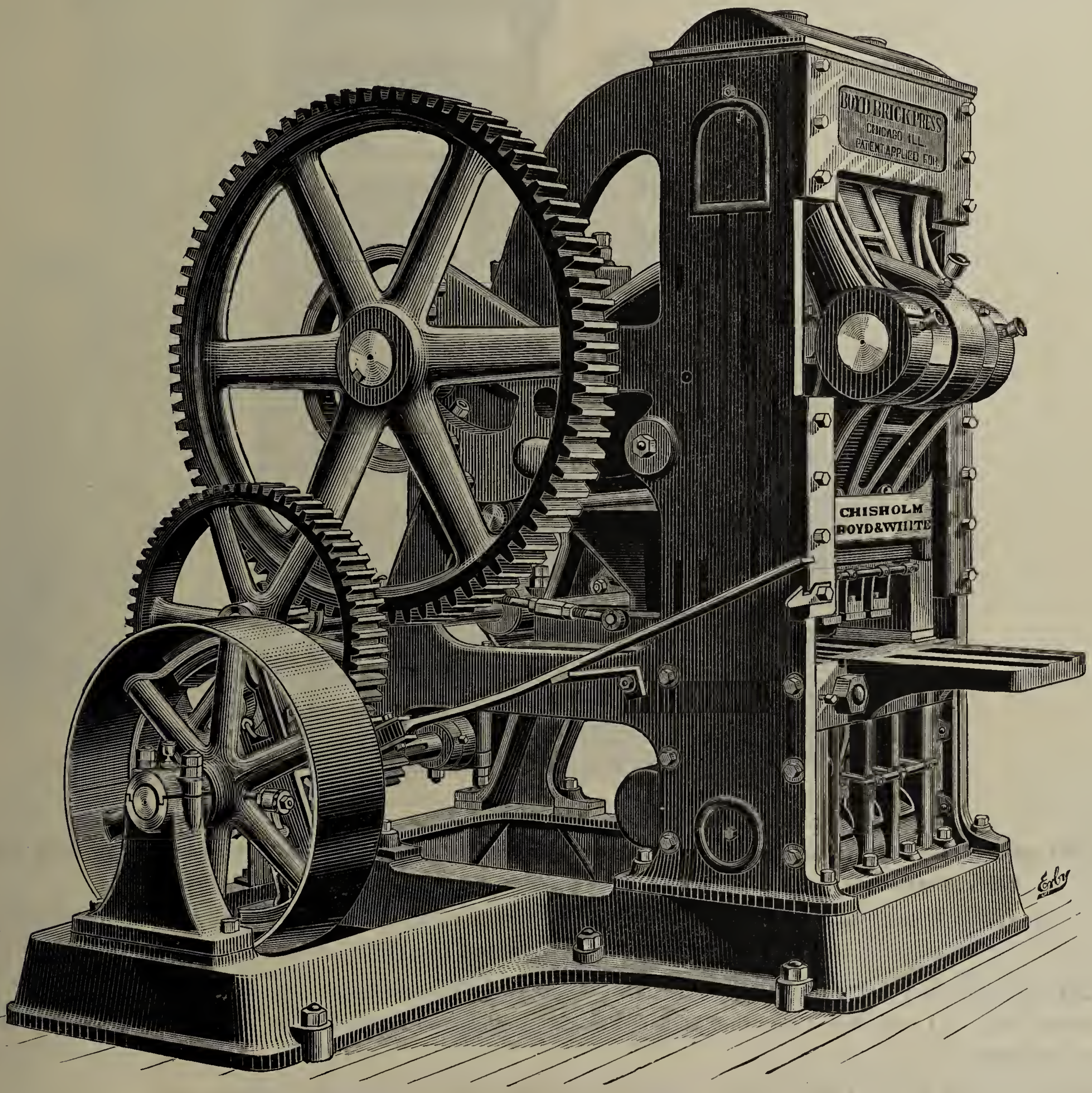
Laclede Building, ST. LOUIS, MO.



EASTERN AGENCY, 1321 F STREET, N. W., WASHINGTON, D. C., FRANK P. STONE, AGENT.

THE BOYD BRICK PRESS

Will make a greater quantity of Perfect Brick (of maximum weight) per mould for a consecutive number of days than any other Semi-Dry Brick Press in the world and Superior in Quality to Hydraulic Pressed Brick.



☛ Correspondence Solicited.

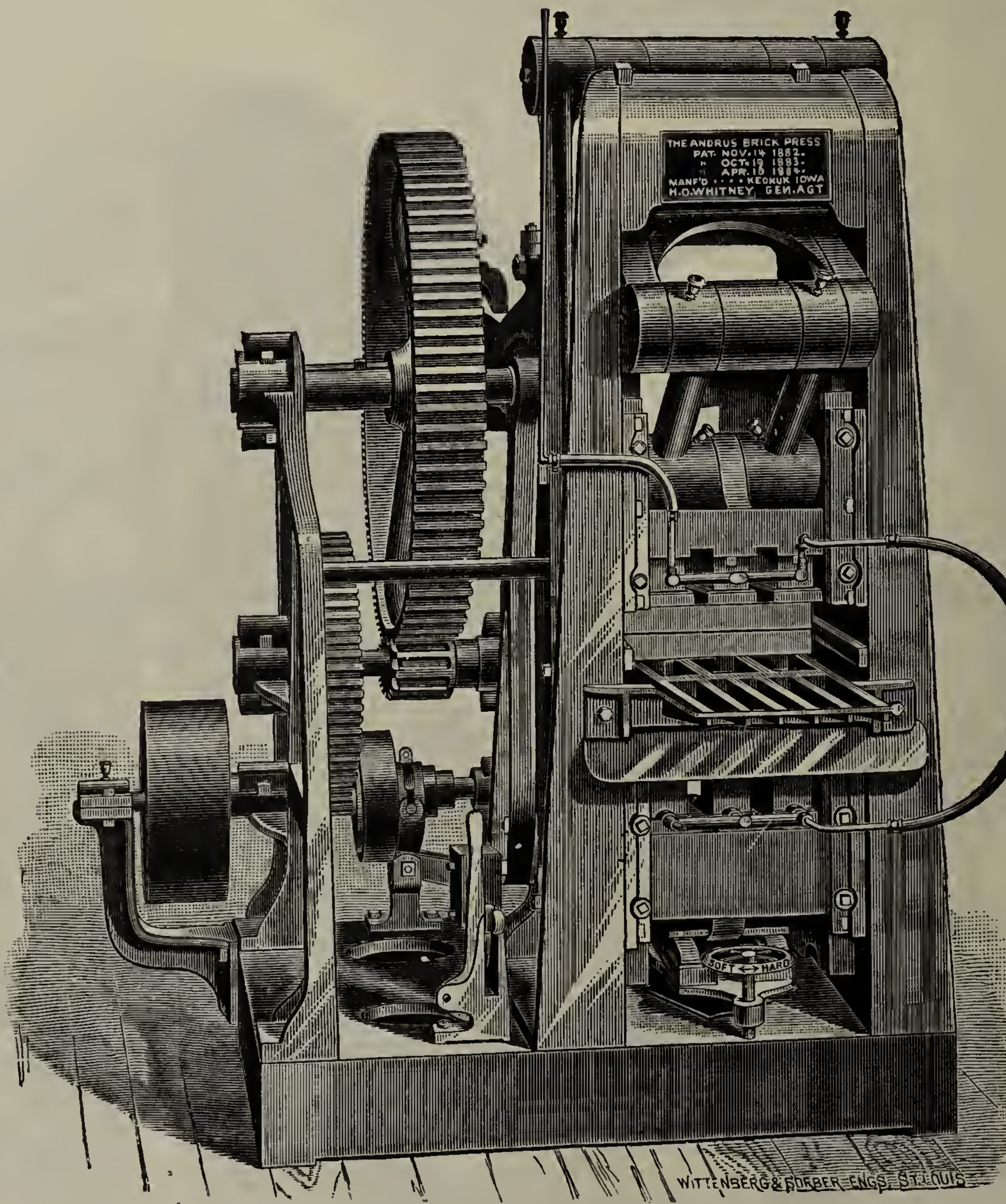
CHISHOLM, BOYD & WHITE,

86 Adams Express Building, CHICAGO, ILL.

THE

Improved Andrus Double Perssure Brick Press.

UNRVALLED FOR SMPLICITY, POWER AND DURABILITY.



The Pressed Brick made on the Andrus Machine have been tested by the U. S. Government and adopted for fronts in Government Buildings.

Built at our OWN FACTORY with heavy forged STEEL pressure arms and fully guaranteed against breakage. Not an experiment but a TRIED and PROVEN success.

60 machines in successful operation the past season. Examine it before purchasing.

Ittner Bros., St Louis, Mo., using the Andrus Presses produced 36 large kilns of brick of unsurpassed quality h e past summer.

Samuel J. Rose & Son, Chester, Pa., and many others have made a splendid success.

The Andrus Press, Clay Crushers and Pulverizers can be seen in operation at all times at Our Factory.

Send for descriptive circular and reference, address

H. O. WHITNEY, Gen'l Agent,

General Office and Factory, KEOKUK, IA. (Mention the Clay-Worker.) KEOKUK, IOWA.

St. Louis Iron and Machine Works, Iron Founders and Builders of Heavy Machinery.

ESTABLISHED 1854.
INCORPORATED 1875.

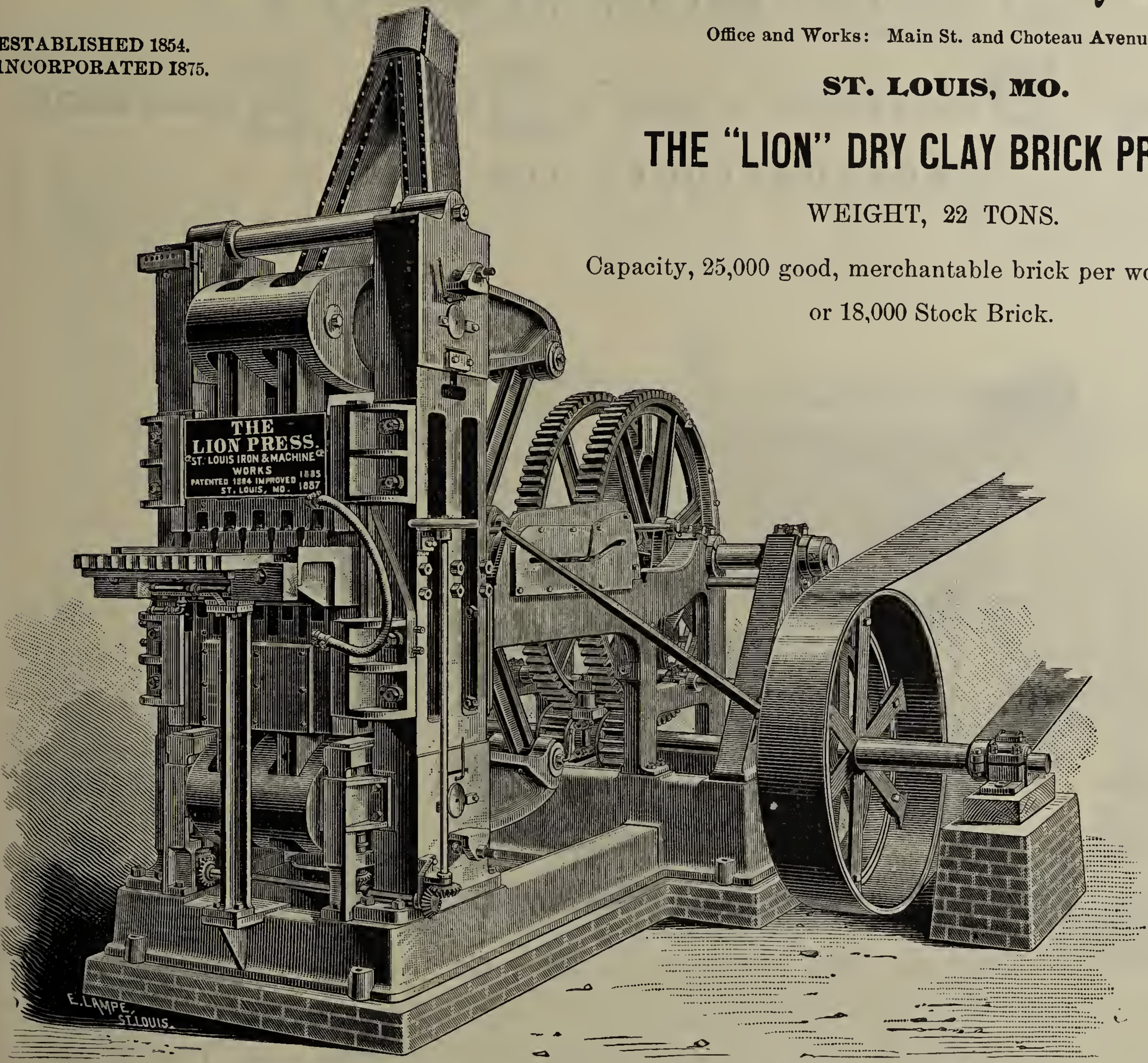
Office and Works: Main St. and Choteau Avenue,

ST. LOUIS, MO.

THE "LION" DRY CLAY BRICK PRESS.

WEIGHT, 22 TONS.

Capacity, 25,000 good, merchantable brick per working day, or 18,000 Stock Brick.



We claim the following essential features and advantages for our Machine:

1. The main feature of this machine is its great strength, power and durability. The pressure on each brick being 40 tons, and the working parts are so strongly constructed that there is no spring or give under this working strain. 2. The great simplicity and openness of framing and construction, so that every part of the machine is to easily accessible for inspection, lubrication and adjustment, thereby reducing the necessary repairs, incidental of every Brick Press, to a minimum. 3. Pressing 5 bricks at each revolution of Machine, keeps the regular force of off-bearers and setters fully employed, which a 4 Brick Machine cannot do. 4. The adjustment of machine from common to stock brick and vice-versa, can be made in a few minutes' time.

Besides the Press, we manufacture and furnish a complete set of clay preparing Machinery, Elevators, Mixers, and Rollers; also Engines and Boilers complete. We also build different kinds of Steamboat Machinery and Stieam Boilers, Corliss Engines, Cotton Compresses, Water Work Plants, Coal and Mineral Mining Machinery, Bridges Work, Hoisting Travelers, Cranes and Elevaters; also general and large castings and Machinery. Any further information cheerfully given.

TESTIMONIALS.

St. Louis Iron and Machine Works, St. Louis, Mo. KANSAS CITY, MO., September 28, 1888.

GENTS: The two "Lion" Presses I bought from you about two years ago have given me entire satisfaction. As a dry clay press I think they have no superior. I prefer the "Lion" to the "Hydraulic". Ever wishing you success with the "Lion," I am,

Very Truly Yours, DRURY UNDERWOOD.

OFFICE OF
TENNESEE BRICK MANUFACTURING CO.,
NO. 7 MADISON STREET,
MEMPHIS, TENN., September 28, 1888.
St. Louis Iron and Machine Works, St. Louis, Mo.

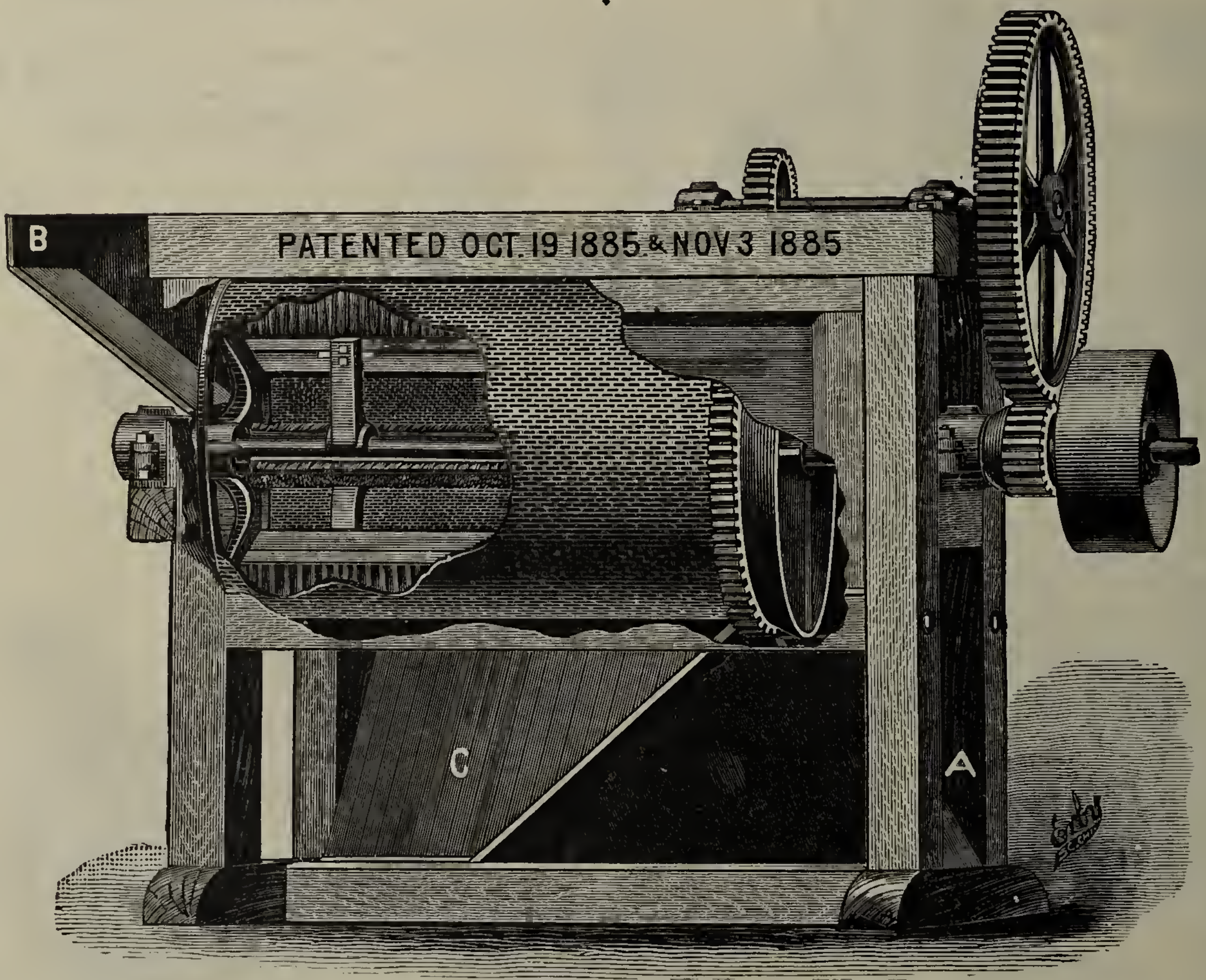
GENTLEMEN: In reply to yours of 25th inst., we beg to say that our Company contracted with you last spring for one of your "Lion" Brick Machines, having concluded, after our President and Superintendent had thoroughly investigated most of other machines, including the Hydraulic, that yours possessed more advantages and promised better results. In due course the machine was delivereed, set up and put into operation. After having operated it all summer to full capacity, we are more than pleased with results and can heartily recommend the Machine to any one contemplating a purchase. To fully appreciate the merits it must be seen performing work.

Wishing you that eminent success which you so well merit we remain Yours Truly, C W. EDMONDS, Sec. and Treas.

THE BOYD

Clay Pulverizer and Stone Separator.

ACKNOWLEDGED THE BEST.



B.
Dry or Semi-Dry Clay goes in here.

C.
Pure Clay comes out here.

A.
All Stones, Pebbles & foreign substances come out here.

I OFFER to those engaged in Clay-working, a machine that has no equal for removing Stones, Roots, Pebbles, or other foreign substances, and reducing Clay to Granules, for Dry or Semi-Dry Press Brick making, Terra Cotta, Tile, or other articles manufactured from Clay, which require a *Strictly Pure Quality.*

It is especially valuable to makers of Fine Press Brick, Tile, or Terra Cotta, as the lime-stones and pebbles are removed entire—not crushed and left in the clay. This machine is not a crusher, and will not pulverize wet clay or mud. The clay to be pulverized in this machine must be in a dry or semi-dry state.

Its capacity is from 40 to 60 tons per day of ten hours, and requires only from 4 to 6 horse-power to drive.

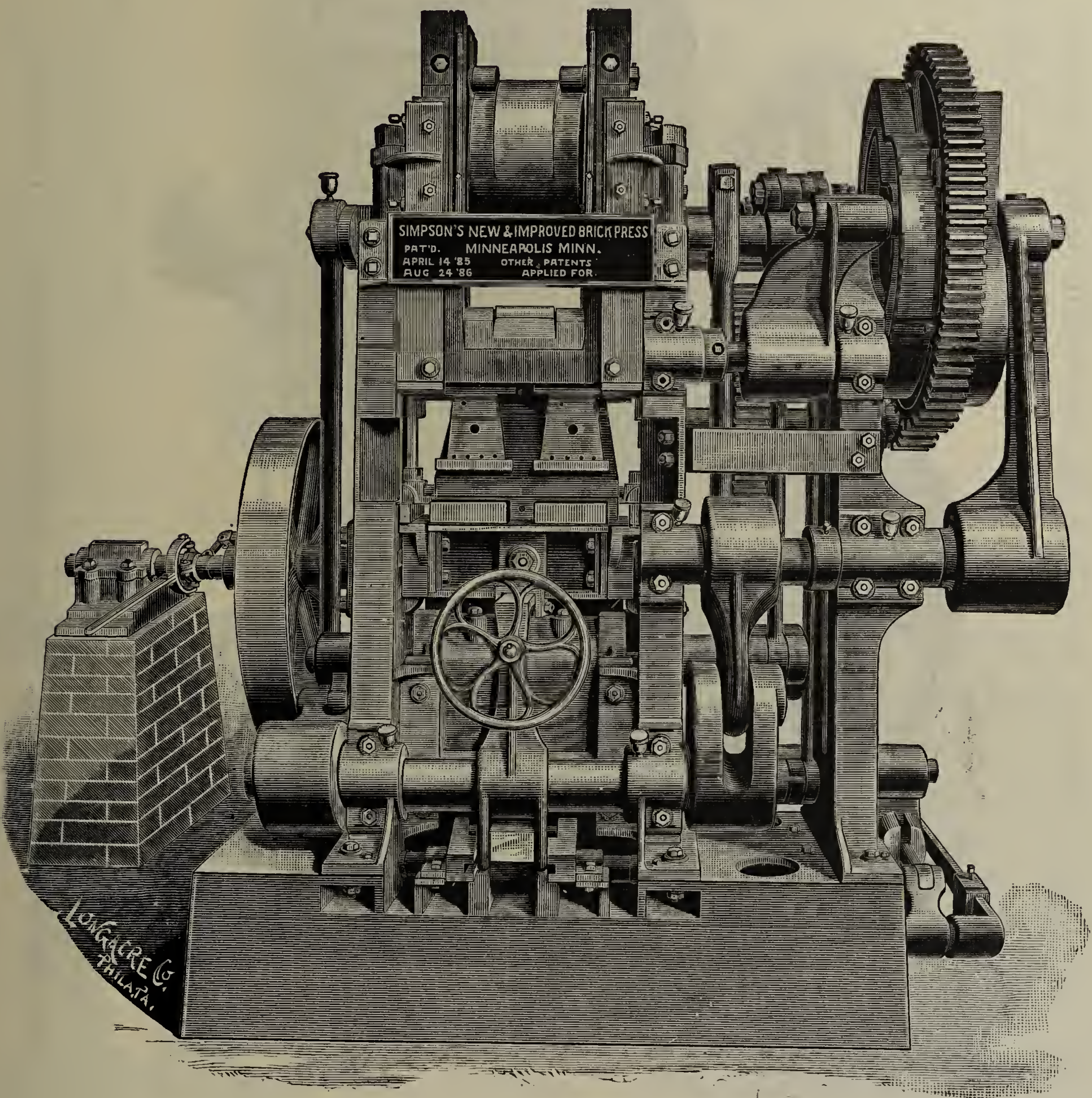
ROBERT B. SMITH,

OFFICE, NOS. 116 and 118 DEARBORN STREET, ROOM 55. *Licensed Manufacturer.*

CHICAGO, ILL.

❊ Agency of the Carman Dry or Semi-Dry Press Brick Machine. ❊

SIMPSON'S NEW
AND
IMPROVED BRICK PRESS


SIMPSON'S NEW & IMPROVED BRICK PRESS
PAT'D. MINNEAPOLIS MINN.
APRIL 14 '85 OTHER PATENTS
AUG 24 '86 APPLIED FOR.
LONGACRE CO.
PHILAD'A.

Send for particulars and prices

SIMPSON BRICK PRESS CO.,

44 Tribune Building, **MINNEAPOLIS, MINN.**

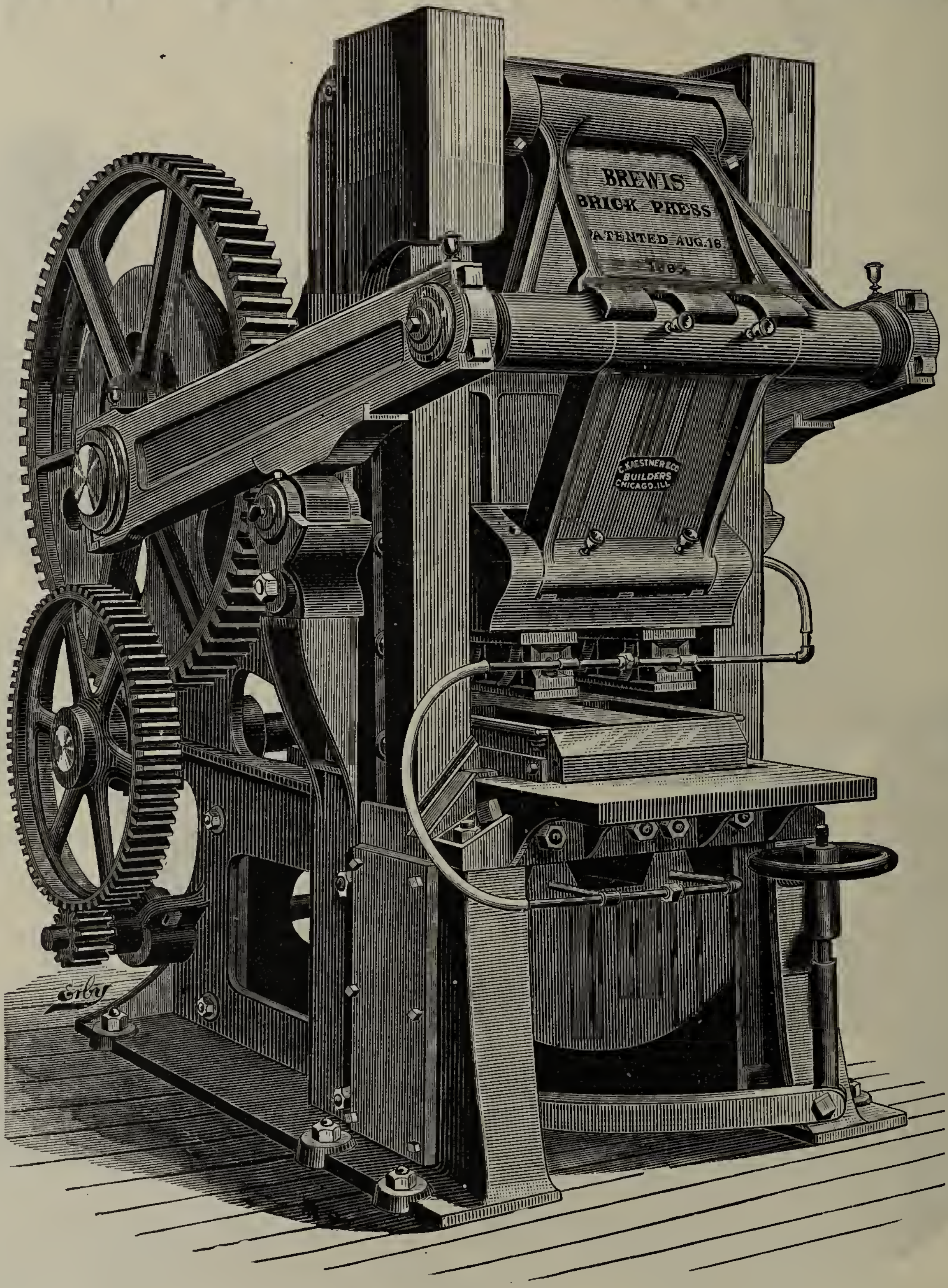
The Brewis Patented Brick Press.

SIMPLE AND DURABLE.

Guaranteed to make as many Perfect Brick per mould as can be made on any machine now in the market. We except none.

Fully covered by patents. **We protect our purchasers.**

Capacity 8,000 to 16,000 a day depending upon the clay



Shipped to responsible parties on 30 to 60 days trial.

Guaranteed against breakage for Two Years.

We furnish the Boyd and Raymond Pulverizers at prices that defy competition. Send for Circulars and Prices to

CHARLES KAESTNER & CO., Machinists and Founders,

ENGINES, BOILERS, PUMPS, SHAFTING, PULLEYS, HANGERS, ETC.,

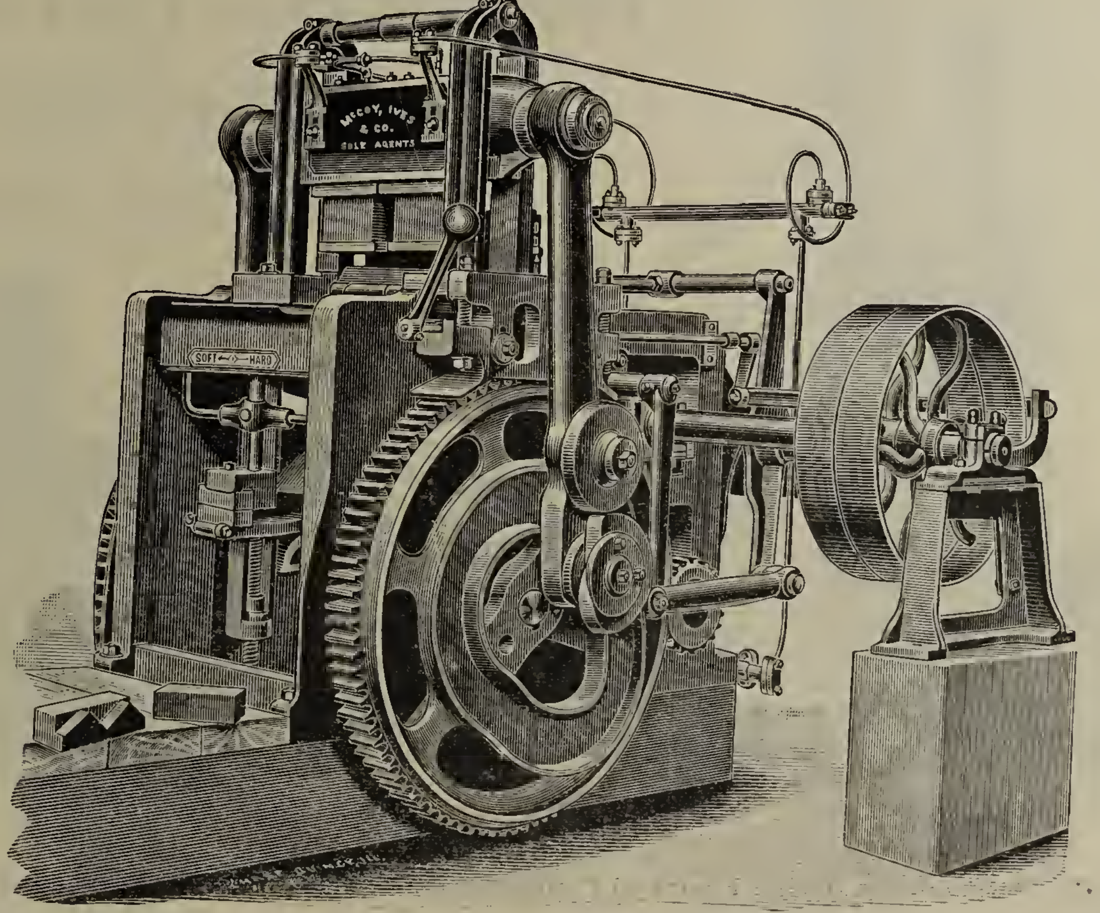
[Mention the Clay-Worker.] **303-311 South Canal Street, CHICAGO, ILL.**

WHITTAKER'S CELEBRATED

SEMI-DRY BRICK MACHINE

[Patented in U. S. May 13, 1884.]

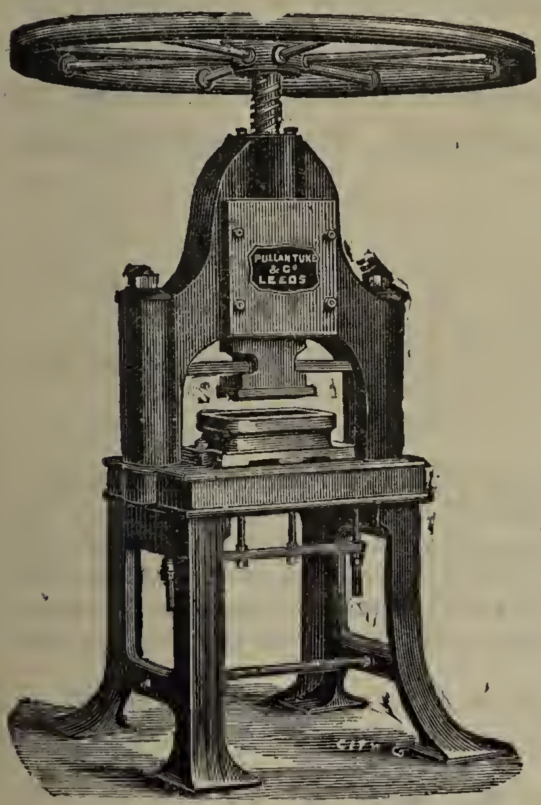
THE BEST ON EARTH.


McCOY, IVES & CO. SOLE AGENTS
SOFT HARD

THE BEST ON EARTH.

For Circulars and other information address **McCOY, IVES & CO., Quincy, Ills.**

Titlev's Patent Screw Press.

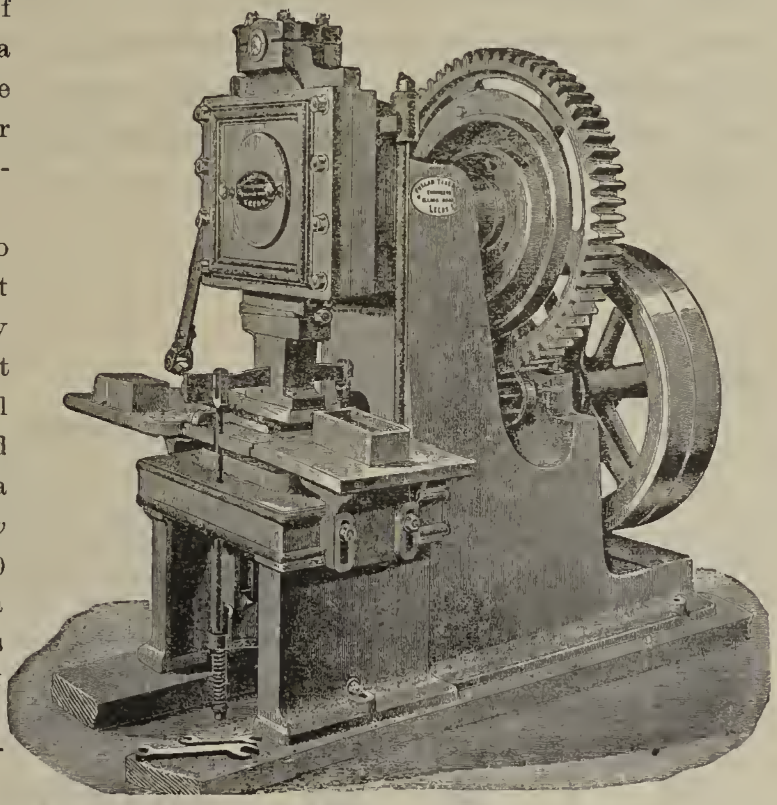


WE beg to call the attention of Brick, Tile and Terra Cotta Makers to these two Presses as the *Peers of any press on the market* for superiority of finish in the work produced.

The *Steam Press* is best adapted to large works and will produce the best quality of Front Bricks. Its capacity is 10,000 per day of the finest bricks at the smallest cost for labor. For small works and for all makers of moulded and ornamental bricks, tiles and terra cotta, we recommend the *Screw Press.* It will exert a pressure of 30 tons and is to-day *without a rival* a the *best press on the market.* Its capacity is 3,000 to 4,000 plain brick per day.

Send for circulars giving all information, with testimonials.

Pullan, Tuke & Gill's Patent Steam Press



ALFRED CROSSLEY,

Sole Agent for the United States. **Ironton, Ohio**

(Mention the Clay-Worker.)

I. & M. WOLFF & COLEMAN

THE "IRON CLAD"

STEAM DRIER.

Automatic,
Simple,
Efficient.

Features Radically Different from any other Drier.

Is Broadly Secured by Bona Fide Patents.

Buildings Not Expensive to Construct.

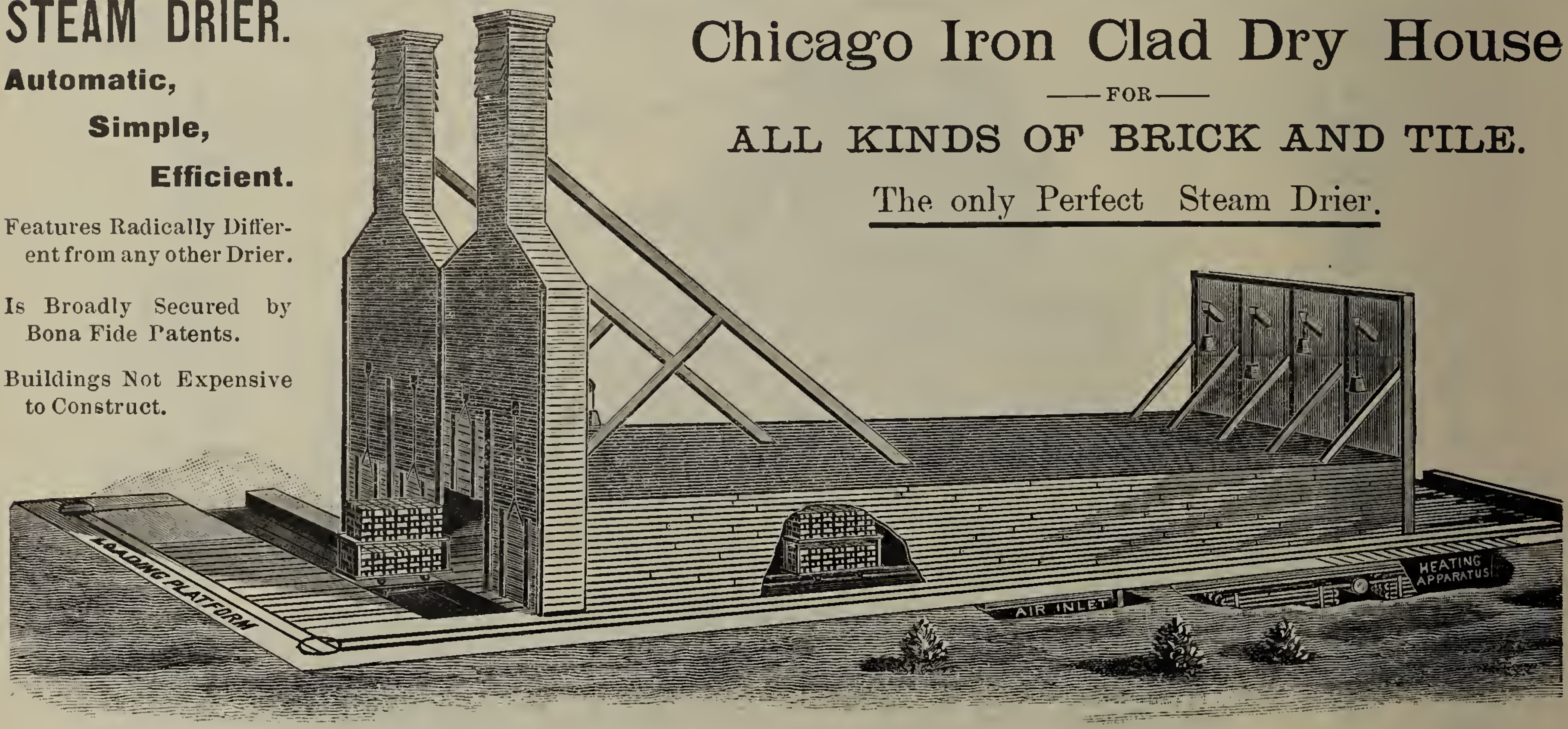
Patentees and Sole Builders
—OF THE—

Chicago Iron Clad Dry House

—FOR—

ALL KINDS OF BRICK AND TILE.

The only Perfect Steam Drier.



This Dry House is a combination of the Drying Floor and Tunnel System. The radiation from the Iron Floor extending over the heating coils dries the lower tiers of bricks. The perforation of the Iron Floor gives an even distribution of the heat and prevents cracking. The steam heat is not so intense as to melt down the bricks or bake them. The bricks are dried uniformly; they come out smoothly and burn evenly, with a good ring. The water-smoke is drawn off rapidly as made and the drying is even and gradual. Stiff mud bricks are haked on double deck cars and thoroughly dried in 24 hours. Soft mud bricks are dumped on pallets and cars carry the same through Dryer in 24 hours. Semi-dry and dry pressed bricks are specially provided for and can be dried without injury. We can convert other Dryers into our system, thereby improving product and capacity. Our buildings are constructed enentirely of wood; are simple, cheap and easily erected. We furnish complete steam heating apparatus with pipes and connections, Iron Cars, Turn-tables, Transfer Cars, Rail and superintendence. Confer with us before contracting elsewhere. We will save you money time and trouble. State character of bricks made, name of machine used and capacity required.

CORNING, N. Y., February 11, 1889.

Messrs. I. & M. Wolff and Coleman,
102 *W. Washington Street, Chicago, Ills.:*

GENTLEMEN—Your Mr. W. C. Byrne arrived here one week ago to see how the Dryer which you people put in for us was doing its work. A part of the time that he has been here the mercury has been 10 degrees below zero and the brick has dried as well as in midsummer. The Dryer, size 28x76, is doing all that you claim for it and we are sure if your directions are properly carried out it will dry more than 20,000 brick per 24 hours. Before we purchased this Dryer from you we visited several places where the hot air Dryers are in use and had partially decided to put in one of them; but seeing your Chicago Iron Clad Steam Dryer, advertised in the CLAY-WORKER, we commenced to investigate the merits of your Dryer. Of course we were told that steam was a failure; but we saw it different and we must say that this Dryer has been put in by you people to our entire satisfaction. Yours respectfully,

CORNING BRICK WORKS, by C. M. RUBRIGHT, Sec'y & Treas.

I. & M. WOLFF & COLEMAN,

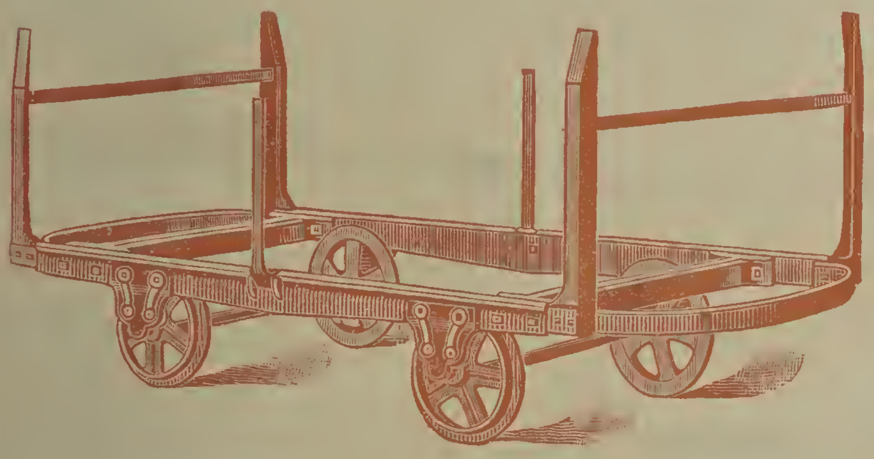
PATENTEES AND SOLE BUILDERS,

Write for catalogue.

No. 261 Dearborn St., Chicago, Ills.

The Iron Clad Steam Dryer.

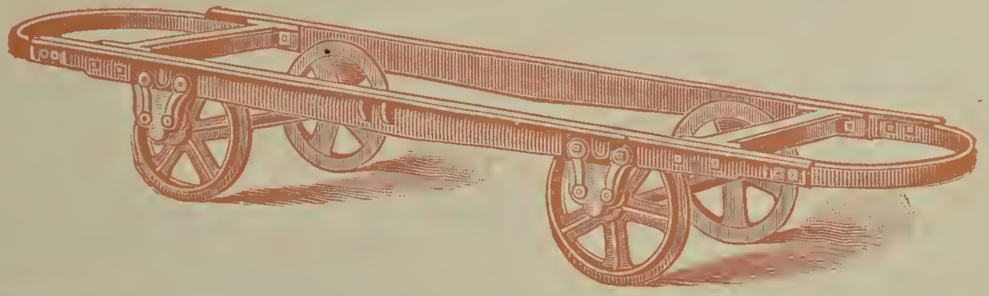
It will pay you to have your bricks thoroughly and equally dried before setting in kiln. You can dry them more economically in our Steam Dryer than in the kiln, besides getting a more uniform burn and better bricks. Handling and wheeling bricks costs money, and the bricks are often marred and in bad shape when they go to the kiln.



No. 1.

These trucks are strong and well made throughout, and the axles run in anti-friction rollers and are easily handled by one man:

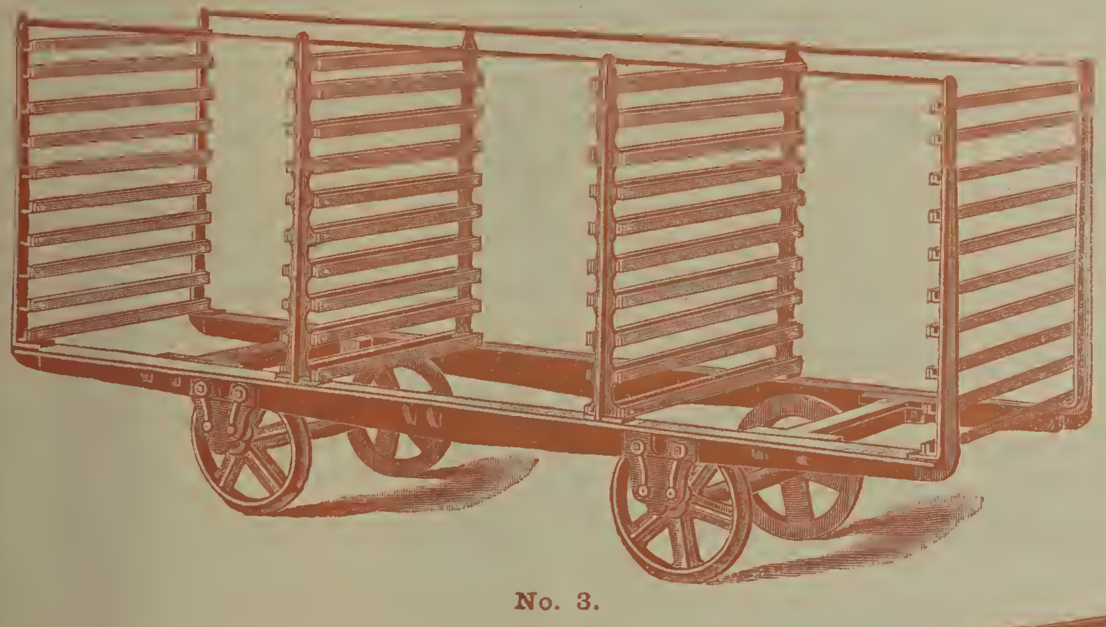
Cut No. 1 shows our double decked car, which we use for all the varieties of brick, sufficiently stiff to be baked; on the lower deck of which we bake four tiers high, and on the top deck five. This car is suitable for all of the stiff mud brick made by the various Die machines. It is also adapted for the drying of dry pressed and semi-dry pressed bricks.



No. 2.

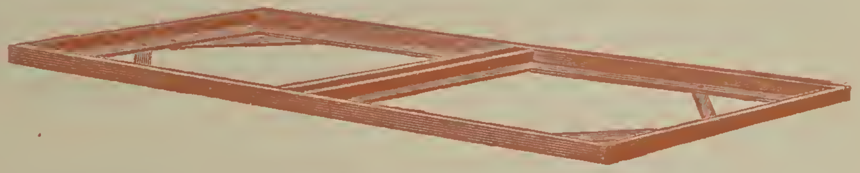
Cut No. 2 is a simple frame car which is used for foot pallets, or this car can be converted into car No. 1 or 3.

Cut No. 3 is for bricks that are too soft to bake and when pallets are necessary.



No. 3.

These racks, together with the car, are constructed entirely of Iron. They will be found strong, light and durable, and afford the best method of using pallets. They do away with the use of the foot pieces on the pallets, which are so much annoyance in handling. The pallets are made to slide upon the wrought iron bars which act as braces for the posts. We make these racks for the pallets to slide in lengthways of the car, so as to bring the side of the bricks towards the heat and also afford conveniences of putting in and taking out the pallets. You can reach across the car easier than lengthways of it. These cars are 8 feet 6 inches in length, and 34 inches wide.



No. 4.

Cut No. 4 is a substantial as well as a light frame—made entirely of wrought angle iron, and strongly braced, which is to be used for a top deck in the car, in cut No. 1.

ADDRESS,

I. & M. WOLFF & COLEMAN,

261 Dearborn Street, - - 14 Third Avenue,

CHICAGO, ILLS.

The Chicago Iron Clad Steam Dry House.

The merits of this successful Dryer are meeting with universal appreciation, and we are constructing them for Tile, Dry Pressed Brick, Semi Dry Pressed Brick, Stiff Mud Brick, and Soft Mud Brick.

In all sections of the country from Maine to Louisiana and for the many different varieties of Clay.

The loss by cracking, marring and breakage is less in this Dryer than in furnace dryers. We guarantee the consumption of fuel to be less, and the quality of bricks turned out better than in dryers using application of Fire Heat and the saving of expense of a special fireman.

Wooden Pallets and wooden buildings are used in our Dryer and the heating coils are protected by iron making it the only Fire Proof Dryer in the market.

I. & M. WOLFF & COLEMAN,

261 Dearborn St., CHICAGO, ILL.

THE CLAY-WORKER

VOL. XI. INDIANAPOLIS, IND., MAY, 1889. No 5.

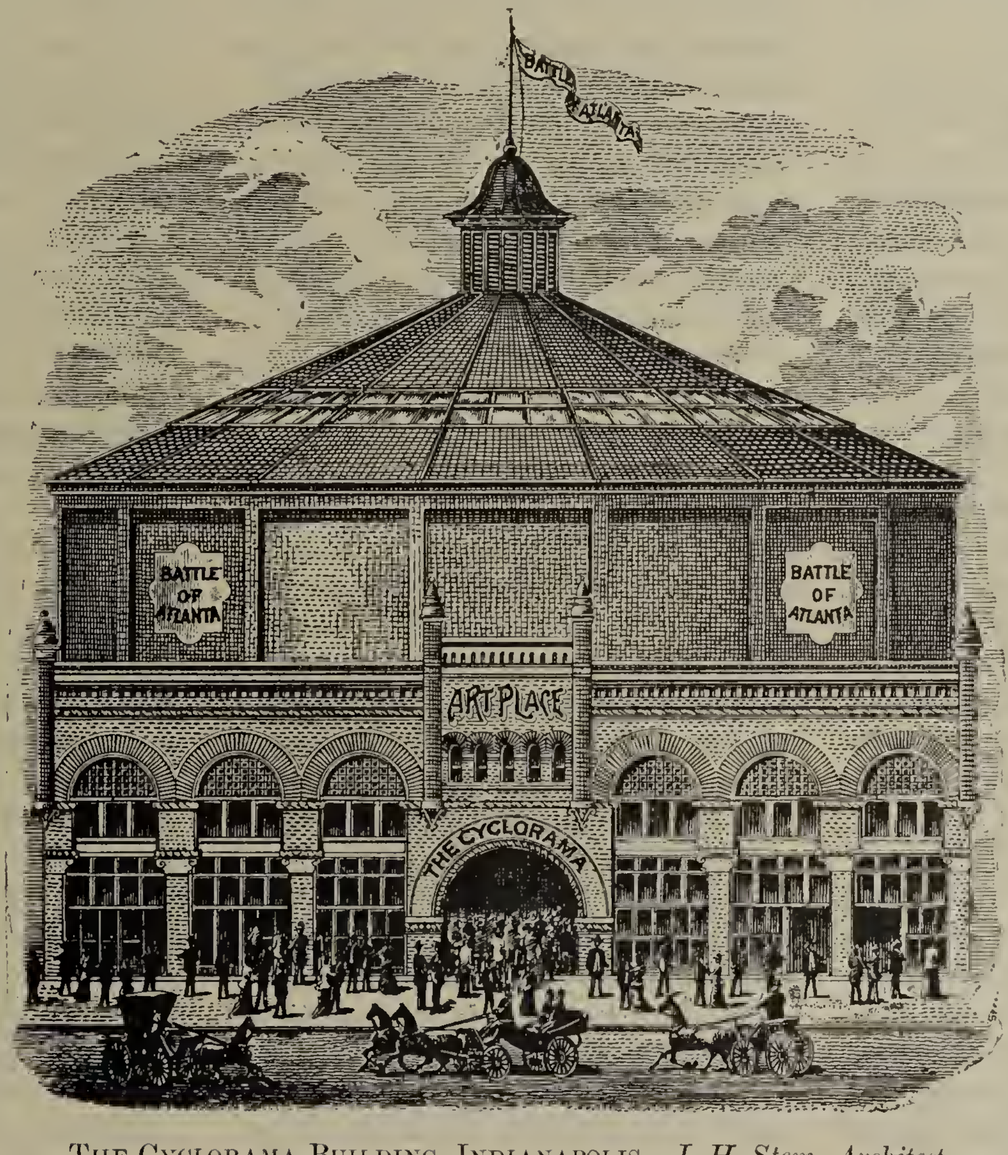
Written for the Clay Worker.

EXAMPLES OF AMERICAN BRICK AND TERRA COTTA WORK.

No. 15.

CYCLORAMA BUILDING, INDIANAPOLIS.

We herewith present to our readers a view of the Cyclorama Building situated near the State House in this city. It has a frontage of 132 feet with an arcade extending from Market Street to main building, store rooms, business offices and stairway to second story front the Arcade. The front brick are laid in red mortar. The ornamentations in terra-cotta were furnished by the Indianapolis Terra Cotta Co. The main or Cyclorama Building is one of the largest in the country, being 400 feet in circumference and 100 feet in height. In the center the walls are 52 feet high. The entire inside of the outside wall is covered with the great painting of "The Battle of Atlanta." E. C. Miller, Builder and Contractor. Built from designs and plans by J. H. Stem, Architect.



THE CYCLORAMA BUILDING, INDIANAPOLIS—*J. H. Stem, Architect.*

FIRE BRICK PAVEMENT.

In Wheeling, W. Va., fire bricks for street pavements have been used with marked success. The *Manufacturer* of that city says pavements made of this material have been in use there five and six years and are yet apparently as good as new. It adds: The mode of laying the bricks is neither difficult nor expensive. After the grade is fixed, the foundation should be prepared with care with a view to the durability of the brick. A clay bed is the best. If laid where frosts are common and heavy then four inches of good gravel should cover the clay and that topped out with two or three inches of sand. In a warm climate where frosts are not likely to occur, two or three inches of good sand spread on the clay will make a durable bed. In making the bed it should crown about 6 inches for a 40-foot driveway. In laying the brick care should be used to break the joints of each course, then roll with a heavy cylinder. This presses the brick into the sand forming a solid joint underneath, and when sand is thrown on the top a perfect joint is made, making a pavement as strong as a solid arch can make it with a firm foundation under each square inch of it. After covering with a thin layer of sand, the pavement is ready for a thin top dressing of coal tar pitch heated to 300° F., which fills the interstices and makes a covering for the brick that protects and increases their wear. Their is a wide difference of opinion relative to the use of the coal tar pitch. It is generally used in this city, but in some towns, notably Steubenville, Ohio, it is not used. It is generally agreed that it does not increase the strength of the joint, but the covering protects the brick. With this view, the covering of pitch should be renewed once a year which will add about 50 per cent. to the life of the brick.

Care should be observed that the bricks are not made too large. A large brick does not burn evenly and is apt to be soft at the center. All sizes have been thoroughly tested in this city and that experience has fixed upon this size as the best and most durable, viz., 8½x4x2½-in. Fifty-eight bricks will lay a square yard which will make about 17 square yards to the thousand brick. The average cost of these brick is about $10 per M at the yard. The cost of the pavement will depend largely on the amount of grading and filling to be done. In this city where a good deal of grading is required, the average cost of the pavement is $1.25 per square yard, including the pitch top dressing. In some towns in this vicinity, it has been laid as cheap as 95 cents per square yard. But if it is covered with the coal tar pitch about 12½ cents per square yard will be added to the cost. The fire clay to make a good paving brick should contain some iron to make it hard and durable. A fire clay to make a durable furnace lining will not always make a good paving brick, as it must be free from iron or it will melt when subjected to great and constant heat and *vice versa*.

Written for the Clay-Worker.

MANUFACTURE OF ROOFING TILES.

BY CHAS. T. DAVIS.

But few roofing tiles are now manufactured in the United States by the hand process. This method continues to be employed in England to a considerable extent; only slight improvements have been made in this mode of production during the past century. By the machine process there are manufactured at Akron, Ohio, and at other points in the United States, a highly satisfactory quality of roofing tiles at but a small cost when compared with the hand method of moulding. The manufacture of plain roofing tiles by the hand process, however, can be conducted with small capital the process and requirements not being intricate or expensive and the re-establishment of this industry in some portions of the country might prove a profitable venture if operated in connection with other clay works. To conduct, however, the manufacture of all the tiles required for roofing and the numerous other articles generally made in large tileries requires considerable capital and a thorough knowledge of the business in all its details. The clay of which the tiles are made is dug and spread out in in shallow beds to disintegrate during the winter season, the water contained in the clay expanding and breaking it in every direction. At one time very inferior roof-tiles were made in England on account of the careless weathering or preparation of the clay employed and in order to cure this a statue of Edward IV required that all clay for tiles should be dug or cast up before the first of November and not made into tiles before the March following. Sometimes when the clay has not been exposed to the frost it can be disintegrated by spreading it out in thin layers, and exposing it to a hot sun.

Iron rolls are often employed to disintegrate the clay and crush or separate from it all stones and gravel. The clay must next be tempered, that is, reduced to a homogeneous and plastic mass. The usual form of pug mill employed in England for tempering clay for roofing tiles is generally six feet high, three feet in diameter at the larger or upper end and two feet at the bottom. The clay is kneaded and thoroughly mixed by a revolving cast-iron spindle which carries a series of flat steel arms so arranged as to have by rotation a worm-like action upon the clay which is pressed from the larger to the smaller diameter of the tub in which the clay is confined and finally comes oozing out of an aperture at the bottom. In this manner of tempering great cohesive power is given to the clay. After it issues from the pug-mill the clay is usually ready to be moulded into roofing tiles; the moulding is commonly conducted in a shed and most of the manufacturers prefer to place their tiles in the open air if the weather allows.

The moulding-table or bench upon which the tiles are shaped, is supported on four legs which are placed well under the bench leaving the two ends of the top of the table to project liberally. The coal-dust box 14 in.x8in., is at the left hand of the moulder resting on the corner of the table and the moulding-board 14 in.x10 in. is usually placed slightly to the right of the coal-dust box. The mould employed is 12-in.x7¾-in. and ½-in. thick made of oak and usually plated with iron. The moulder when he wishes to form a tile works a lump of clay with his hands into an oblong square; the mould is placed on the bench and fine coal-dust sprinkled over it; the lump of clay is then taken up and dashed down into the mould with force, the surplus clay is cut off level with the top of the mould by a brass wire strained upon a wooden bow and the tile in the mould is finished by adding a little clay to it if necessary, and smoothing the exposed face with a wooden tool. The moulded tile is then placed upon a thin board, first sprinkled with very fine coal dust and so the process is repeated, the lump of clay being added to every time six tiles are moulded.

The boy or off-bearer carries two tiles at a time, one on his head and one on his hands to the floor, where they are allowed to remain for four hours out of doors in fair weather and then collected and placed together, the nib end changed alternately so as to hack them closely and squarely. The situation of this hacking should be dry but not hot, and the tiles remain hacked for two days so as to allow them to toughen. The set or curve form is then given by placing six of the tiles at one time on the top of the horse, which is a three legged stool having the top about three-quarters of an inch longer than the tile, the top being a convex curve to a radius of about ten feet and three inches and having a height of about two feet and seven inches from the level of the ground. In placing the tiles on top of the horse, the nib end is reversed each time and as they lie closely together, three quick blows are given to the tiles with a block which is concave, so as to correspond to the convexity of the horse. The tiles are then again hacked and dried and next carried to the oven twelve at a time, with the edges of the tiles resting against the breast of the carrier.

About nine thousand tiles are commonly burned at one time when the old fashioned Staffordshire oven is employed, but with larger kilns the quantity of course can be increased. The time required to burn the small ovens of tiles is usually about from thirty-six to forty hours

In London tileries, which are the largest in the world, there is paid particular attention to the proper preparation of the clay for the particular purpose for which it is to be used, there not being the same haste to get the clay into the kiln that is so often shown by some of the smaller manufacturers. The first step in preparing the clay in London tileries is the weathering, which is accomplished by throwing the clay into pits covered with water and leaving it to soften or ripen. The clay is then usually passed through the rollers and the stones taken out before it is put into "soak," which is a term also used for the mellowing process. The kilns used for burning the wares produced in these extensive London tileries are usually conical in shape, far more than one-half the height, about forty feet wide at the base, and have a total height of about twenty-five feet from the bottom of the ash-pit to the top of the dome which is slightly convex. These kilns are quite expensive to construct, eight thousand dollars being about a fair average cost as fire-bricks of the best quality are largely employed in the interiors.

The manufacture of roofing tiles is one which is now rapidly growing in public favor. With us the tiles are usually of three colors, red, buff and black. The color of the red tile is produced by the employment of clay containing a large per centage of oxide of iron; this is sometimes present in the beds with fire clays, which are the class usually employed for roofing tiles; at other times it is necessary to mix some foreign clay containing a large per centage of oxide of iron with the material. The color is made deeper and more uniform by rubbing the tiles with finely sifted red moulding sand; this should be done while the tile is quite damp so that the sand can be made to adhere to the tile. The buff colored tile is made of nearly pure fire clay and is slightly lighter in weight than the red tile. The black colored tile is produced by washing it over with manganese dissolved in water before the tile is placed in the kiln, and in the process of burning the manganese is converted into a perfectly durable coating of great hardness.

The small diamond tiles are 6-inx10-in. require 500 to cover a "square" and weigh 600 pounds. They are nailed to the sheathing with two five penny galvanized nails and are used more especially for towers, porches, dormer-windows and in side panels for ornamental purposes. Large diamond tiles are 14-in. x8½in. 250 cover a "square" and weigh 650 pounds. Two six-penny galvanized nails are used to secure it to the sheathing. This kind of tile is used more than the other forms for regular roofs as it is lighter in weight and less in cost.

The shingle tiles are the plain flat tiles. After burning they are three-eighths of an inch thick, have two counter-sunk nail holes and can be made of any required size not exceeding 6-in.x12-in. Tiles have been largely employed in the Eastern States and on some expensive buildings for roofing and side ornamentation as at the State Capitol at Albany, N. Y., on which building they are secured with copper wire to iron ribs. Tiles of this kind are generally laid so as to expose about five inches to the weather which require 480 to a "square" the weight being about 1100 pounds.

The pantiles measure twelve inches in length by six and one-half inches in width at one end and four and one-half inches at the other and if they are lapped three and one-half inches on the roof, 350 will be required for a "square" which will weigh 850 pounds. This kind of tile makes a strong roof cover and can be walked upon without danger of breaking and it is especially useful for workshops and factories. It is sometimes made with lugs to hang on to ribs, the use of nails being thereby avoided, which is desirable, as nails are liable to rust away where much bituminous coal is used. But the tiles are also made with nail holes to secure them to the sheathing boards as for private dwellings, etc. The crestings and finals used with tile require artistic treatment and are generally made by manufacturers of terra-cotta.

Written for the Clay-Worker.

BRICKMAKING AND BURNING.

No. 2.

BY JNO. W. CRARY.

Near the conclusion of my first article in this series, I stated the most practicable way for testing clays in their nature of drying is the sun for if clay will not stand sun drying it will not, as a rule, stand sufficient heat in burning to make a good brick, though if clay cannot be had that will stand sun drying, still a very good brick may be made by tempering clay that cracks in the sun in a "pug mill" and drying the brick on "pallets" under a shed and if there be no shed or pallets the brick may be laid on a yard floor as usual in the sun and as fast as laid down in rows, dust or sand may be sifted on the brick so as to cover the surface thus forming a partial non-conductor of heat so that a rapid contraction of the top surface of the brick is prevented and the evaporation of water in the brick equalized on all sides but in all cases brick dried on a pallet under a shed properly constructed, is at least a third stronger and better than brick dried in a hot sun, especially if there be much wind. The slower and more equal on all sides a brick is dried, the less porous and stronger it is. If it is desired to test clay in burning and no regular brick kiln is convenient, after a small sample brick shall have been made, as I stated in first article, such sample may be enveloped in a coat of clay half an inch thick and after being dried may be put in a blacksmith's forge with a very low heat until well dried off, then the heat may be increased until the clay coating begins to show signs of melting. Then let the fire die out and when cold take out the sample, knock off the coating and though the specimen will not be as good as if burned in a kiln, yet it will determine the practicability of making brick of such clay.

THE BEST WAY TO PREPARE CLAY FOR "MUD BRICK."

Having decided on a "clay bed" for brick: if it is for mud brick, the clay should be dug and thrown up in the late fall or through the winter, so that the rain and frost will disintegrate and soften it as well as to dispose of an excess of salts or flux that may be in it. If clay be dug and hauled to the pit directly from the "bank," it is a difficult task to get it tempered so that the brick will be uniform in size or chemical composition and if a kiln of brick is not made of clay homogeneous in kind, quality and mixture, it is impossible to produce a good uniform size and color of brick.

The tempering of clay is a most important part in the manufacture of clay goods of any kind; nine-tenths of the brick manufactured are of imperfectly tempered clay. A perfect disintegration and amalgamation of clay is absolutely necessary to get the best results in the manufacture of anything made of it for building or domestic purposes. The time is coming when the working of clay will be of as much importance and concern as the manipulation and mixture of iron and steel. Our "Lumbermen" seem to have a mania for destroying all of our timber forests. The ruthless and prodigal waste in the manufacture of lumber and the excessive "out put" thrown upon a glutted and sluggish market will, ere long, exhaust the supply and clay and iron will be chiefly employed in building. The Arcade principle in architecture will be adopted and clay will be moulded in columns, segments of arches and tiles, so that with a little iron the most massive structures as well as the laborer's cottage will be built chiefly of indurated clay.

The streets of our cities will be paved with brick or clay blocks the size of two brick, but the clay must be strong and tempered if moulded, and thoroughly mixed and pulverized, if pressed dry, and in all cases perfectly burned. From these premises it is very obvious that the clay industry will, in all its departments, rank not less than third in mechanical pursuits.

TO PREPARE CLAY FOR "DRY PRESSED" BRICK.

In 1861, January 5th, I had a dry press brick machine of my own invention described and illustrated in the "Scientific American" and I published a circular setting forth the whole theory of making and burning dry pressed brick. My machine gave brickmaking by dry pressure an impetus that has culminated in the fact that with the right kind of clay, handling and burning, the strongest kind of brick may be make by pressing clay dry. If a substantial "plant" is to be made for the manufacture of "dry press brick" it is necessary to have a bed of considerable depth, homogeneous in character from top to bottom. Then the clay should be "caved,' and then cut up well and hauled in under a large shed which should be divided into two parts; one-half of the shed should be filled, say from four to eight feet deep and with enough clay to run the machine three to six months. While that is being used up, the other half of the shed should be filled so that a full supply of clay with its moisture equalized, can be constantly had. The raw material being thus prepared, a machine should be well put up that will pulverize the clay as fine as corn meal and at the same time thoroughly comminute it before it goes into the press. The pressure should be applied slow. If it be a direct pressure press there should be a top and bottom plunger and only one of them act at the same instant, so that the present air in the clay may escape more perfectly. My machine exerted the pressure by a roller which in passing slowly over the mould expelled the air before it. The clay should be dry enough to allow the brick at once to be set in the kiln. My machine carried the brick on a belt immediately into the kilns to the "setters" and the raw clay may be brought from the clay shed to the machine in the same manner so that the whole process may be automatic and all labor saved excepting the clay getting and the setting of the brick. If dry press machines do not do all this the labor-saving feature is lost.

THEORY OF DRY PRESSING CLAY TO PERFECTION.

As I have said previously, clay is a powerful "hydrate." It absorbs water greedily and never parts with it unless subjected to a heat near fusibility. Clay in its different forms, conditions and admixtures with other substances, plays a more important part in the geological interest of the earth's surface and its adaptability to the life and wants of man and animals than any other mineral.

A few of its actions are to absorb mineral poisons and all poisonous fluids that come from the decomposition of vegetable and animal life. If it were not for the absorbing power and neutralizing effect of clay in solution in the vast body of water in the Mississippi and the clay deposits of its great "Delta," no animal life could exist on its shores. Clay in some form is absolutely essential and indispensable to agriculture and so I might go on and enumerate *ad infinitum.* But to the point. It seems absurd to say we can make brick of dry dust—clay; but when we see that dry clay is a term that can only be used relatively, and that in fact, there can be no such thing as dry clay, we may hope to make brick by pressure and I will give you the proof by a test you can make at any time, in two minutes, without costing a cent and you will be astonished most at its simplicity. Take a lump of clay as dry as you can get it, say two ounces, put in on an anvil or other smooth, solid, iron surface; then take a hammer with a smooth face, strike the clay a light blow—you will crush it. Strike again, you will reduce it to an impalpable powder. Increase the force of your blow a third or fourth time and you find a thin, damp, lamelated piece of clay so dense, hard and strong that it resembles metal. The attraction of cohesion is thus perfected so that if five or six pounds of the clay were put in a "Die" and fifty to a hundred tons pressure put upon it, you will have a perfect brick and if burned properly, it would be superior to any plastic clay brick. In a common size brick made by a good "dry press" machine, twelve ounces more clay is contained than in a "mud" brick of same clay and size. After a dry press brick is well made it is simply a question of burning as regards its superiority over a mud brick. Burning mud brick and burning dry pressed brick are just as different as working and tempering steel for a common hoe and the best blade for a sword or spring for a watch.

Written for the Clay-Worker.

BRICK, AS AN ARTICLE OF COMMERCE

BY PROF. R. T. BROWN.

In tracing the progress of the human race from the condition of a savage to our present stage of civilization, we note the curious fact that the introduction of machinery operated by power, other than human muscles, in supplying the wants of man, has always resulted in making the article thus produced, a subject of commercial exchange. The savage, in his lowest condition, made his own bows and arrows, killed his own game, dressed its skin for his clothing and its flesh for his food, made his own garments and wore them. A little further on, and he was a keeper of flocks and his wife prepared the flesh and milk of his herds as daily food, and with the distaff and loom, had learned to convert the wool of his flocks into textile fabrics for clothing and for the tent that was his home as well. Another step took him to the cultivation of the soil and the production of bread material, but for more than 2,500 years the grain of the husbandman was prepared for bread at home—"the women grinding at the mill," and it was only in great cities like those of Egypt, that the wealthy performed this work by their slaves, or purchased the finished product after it was completed. This was true of the textile fabrics also. While the rich, by the labor of their slaves produced a large surplus for the market, that clothed the wealthy in "purple and fine linen every day," the common people made their food and clothing at home.

Though water was used as a motor as early as the third century of our era, it is less than 500 years since it came into general use in the manufacture of bread stuff, and flour became an article of commerce. Until steam was taught to spin and weave, nearly all our clothes were made from fabrics of home manufacture; but with the introduction of steam as a worker, came the age of the "ready made." It does not require more than human prescience to see that brick will follow in the line of every other product where an inanimate force takes the place of hand labor in its production. The chief obstacle which hinders machine-made brick from becoming an article of commerce, immediately, is its heavy transportation. But the application of machinery to the manufacture of brick is in its infancy, and we may confidently predict that such improvements will be made, as will give the machine brick such a superiority in quality and in the speed of production, as well, as will command the market in all places within the reach of railroad or water transportation. The manufacture of brick by machinery is scarcely more than half a century old and our best machinery is far from being perfect, yet we are able to mould 50,000 bricks per day, of a quality that will compare favorably with the average of hand-made brick; and we are able to dry them ready for the kiln in half the time that would be required to dry them on a yard, and without the risk of loss by rain. In doing this work the expense, at the ordinary price of fuel, does not exceed fifty per cent. of the cost of the same number of bricks made by hand.

The ordinary method of burning brick in extemporized kilns, involves a great waste of fuel. In the country, while wood was plenty, but little account was taken of this; but fuel has come to be an object of economy, and every improvement that saves it is of prime importance in brickmaking. The massing of 50,000, or even 25,000 brick in a continuous kiln effects a great saving of heat, other things being equal. But there is a leak of heat in brick-burning which has not, as yet, been successfully arrested. From the time the watersmoke disappears, there is a rapid current of dry, heated air ascending from the surface of the burning kiln, if that surface be open—if not, then from the draft flues. In this there is generally lost, more than heat enough to dry an equal number of green brick, and prepare them for the kiln.

Economy in the expense of burning brick and the ability to burn thoroughly with the smallest possible per cent. of loss, are matters of the first importance in the manufacture of brick for the general market. We are convinced that manufacturing capitalists in general, and clay-working factors in particular, have not duly appreciated the importance of natural gas as an element of success in this direction. The gas field of Indiana, stretching from the center of the state, in a northeast direction into Ohio, in a belt of an average width of at least fifty miles, gives an area of more than 5,000 square miles; on every section of which, with scarcely an exception, gas may be obtained at a depth, ranging from 900 to 1,000 feet, and in quantities sufficient to supply a manufacturing plant of the first magnitude. This field is a comparatively level territory already traversed by half a dozen railroads in active operation, and as many more as are needed may be constructed with but little more expense than that of ties and rails. This region abounds in beds of clay adapted to every variety of common clay work. As yet, no fancy prices have been placed on available situations for a manufacturing plant. A bed of good clay near a railroad may be selected and 40 acres purchased at about $50 per acre—perhaps less. A boring to the gas will cost $1,000 or $1,200. This will ensure fuel for all purposes, which will be under the absolute control of the proprietor. Cottages for the occupancy of the laborers employed may be built and rented for, at least, the interest on their cost; but nearly all the labor of the plant may be done by steam power, costing no more than the interest for the sum expended for the boring and piping. This is a constant power, not liable to the casualties of drouth or frost, nor to the strikes of coal miners, or railroad laborers. In its use gas incurs less expense than any other fuel. It requires no fireman to handle the fuel, and no team to supply it, nor to remove the ashes and cinders. Moreover, it is uniform and constant in its supply at whatever rate you set it and it requires little or no attention, till it is desirable to change the rate of heating.

In burning brick, tile, or other clay products, gas is the most manageable form of fuel because it is all flame, and when properly supplied diffuses itself pretty uniformly throughout the kiln, filling every vacant space with flame of nearly the same temperature. The result is, uniform burning—no melted arches and but few salmon bricks. We can afford to burn more thoroughly, for it costs no more to burn two or three days longer, than not to burn.

With gas to generate steam and to burn our kilns, brick, from a good machine, may be placed on the cars, ready for the market, at a cost not exceeding 33 per cent. the price of hand-made brick. With fair rates of transportation, this will enable the brickmaker in our gas field to compete profitably with hand-made bricks anywhere within 300 or 400 miles. Under these circumstances, brick must, in the near future, become an article of commerce.

[NOTE.—I have written the foregoing at the suggestion of no one. I have no pecuniary interest in a single acre of the gas field, nor in the stock of any gas company. I have written for the public good only.]

Hollow Brick, it is said, are coming into more general use in eastern cities, and quite a number of large buildings have been built with them. They crush at 30,000 lbs., or about the pressure which the best solid brick will stand. They are made 8x8x12, with walls one inch thick. It is claimed that they cost one-third less than the regular form, making walls proof against fire, moisture and frost, being warm in winter and cool in summer. They require a peculiar clay in their manufacture, one that will not shrink when dried or burned. The brick are set on end, thus making a wall hollow from top to bottom.—*Ex.*

Written for the Clay-Worker.

BURNING AND BURNERS.

BY D. W. STOOKEY.

The most important part in the process of manufacturing clay wares is that of burning. At this stage all the cost of production has been expended and any loss here involves not only the loss of the labor and expense of burning but the whole cost of the ware from the crude material to the finished product. The loss of a piece in the kiln is equivalent to its loss as a completed article ready for the market. Each handling and every stage in the process of manufacture represents and involves an additional expenditure of value and these are all accumulated in the burned ware. Not only is the expense of production lost but the profit that the manufacturer hoped to realize from the sale of the ware is also lost as he is deprived of the sale. Ten pounds of clay in the bank may be of no appreciable value but after this amount has passed through the different stages of manufacturing it may be worth—nothing, if injured in the kiln or several dollars if it comes through in the condition desired by the manufacturer.

There are several objects or results to be obtained in burning clay wares and these are attained at different temperatures. The first is simply a mechanical change and consists in drying or driving off the moisture that is mechanically held in the clay and that remains after the ware has been dried subsequent to having received the desired form either in the plastic state or by the process popularly known as dry pressing. This drying is accomplished at comparatively low temperatures and the best results are obtained by a free circulation of large quantities of heated air through the kiln. The second is a chemical change in which the combined water is driven off and the composition of the ware changed. An ideal or chemically pure clay is a hydrated silicate of alumina. In this state, when properly moistened, it is plastic and may be given varied forms and again reduced to its original state or condition as clay. When the chemically combined water is driven off it loses its plasticity, ceases to be clay, and cannot again be reduced to its original clayey condition. This occurs at the temperature indicated by dull redness. Another change consists in fusing or melting some of the constituents of the ware. Clays in the natural state contain varying quantities of impurities. Many of these are fusible at the temperatures reached in the kiln. When so melted these ingredients combine, both mechanically and chemically, with each other and with those parts of the clay not fused and when cooled the results are manifested by the hardness and vitrified condition of the clay product. The two changes last named give to burned clays their apparently indestructible properties and make them practically proof against the ordinary influences of air, water, acids and the destroying tooth of time. Change of color is another result obtained and often desired in the process of burning. The effect known as glazing is also wrought in the kiln under the influence of heat. The size and form of the pieces must be maintained as nearly as possible during burning and the texture made as strong and enduring as can be done from the particular clay used.

The burning must be adapted to the class of ware in the kiln. If it is desired to produce face brick the heat must not be raised high enough to injure the color nor melt or warp the brick out of shape, whereas, if paving brick are wanted they must be burned harder. In this case hardness is of the first importance and must be obtained even at the sacrifice of color and form. If a salt glaze is to be applied the temperature must be raised to the degree at which the clay will take the glaze while if only biscuit ware is wanted the kiln need not be heated to the high temperature necessary to the formation of a salt glaze.

The production of these results in the shortest time with the least possible consumption of fuel is the task undertaken by the burner. Many difficulties and opposing influences beset him and, like Christian, he must surmount them all if he would reach the goal at last. If the ware is damp when set in the kiln he will need to be careful in the early stages lest he crack some pieces or injure the color of others. If he fires too slowly he not only loses time but consumes more fuel than is necessary. If he fires too fast he heats the ware on the exposed side faster than the other, thereby causing unequal expansion and consequent cracking, or he forces the drying and thus injures both texture and color. If the wind is blowing the draft will be stronger and the fires will burn faster while the increased flow of air through the kiln tends to carry away heat. If the wind ceases he must reduce the supply of fuel and admit more air to carry the heat from the furnaces into the kiln and thus prevent overheating near the fires. The amount of fuel necessary and the condition of the fires should vary as the burning progresses and the judgment of the burner is taxed to decide what is needed at each stage. If the fires are too hot during the last hours of burning the ware may be melted, thus losing its shape and becoming discolored, if not hot enough little or no progress will be made. If the kiln is closed too soon much of the ware will be too soft, if not closed soon enough part will be burned too hard. Since it is impossible to get a uniform temperature throughout the kiln, parts must be left softer than is desired while those nearest the fires will be slightly overdone in the attempt to bring those most remote to the desired temperature. Judgment must be exercised in order to strike the best mean between the two extremes. When the burning is finished and the kiln is to be closed the experience of the burner is again called into requisition. If the kiln is closed too closely while very hot and there is a quantity of unconsumed fuel in the furnaces the confined heat may injure some of the ware. If the kiln is not closed closely enough there will be a current of cold air through the ware that will carry heat away too fast and much cracked and "shaky" ware will probably be the result.

With these facts ever in mind the greatest care and best skill should be employed in burning. The best kilns should be used and they should be attended by the most faithful and intelligent men engaged at the works. Only an intelligent man can ever become a successful burner. He who heedlessly tries again and hopes to "have better luck next time" should be given some other work. The man who carefully watches the work and notes each step and the results; who examines the kiln while it is being drawn and marks the condition of the ware in each part, is in possession of experience that will go far towards insuring him "better luck next time."

Since the composition of clays is so variable and the possible styles and conditions of kilns infinite, no fixed rules for burning can be given and a burner's experience only relates to the clays and kilns with which he is familiar. Those who burn one clay successfully would probably fail ignominiously in their first attempts with another, while he who is ripe in experience with one style of kiln would be a novice with another.

Effect follows cause and will continue to do so while the laws of nature remain immutable. If the clay-worker is not successful in burning his ware there is a reason for it that he may discover if he will investigate the matter earnestly and intelligently. If the fault is in the kiln it should be so changed as to remedy the defect. If the burner is incompetent he or the incompetency should be removed. A careful, intelligent study of the defects will lead to the discovery of the cause and when this is known the remedy may certainly be found. Industry, intelligence and ingenuity, are traits of the successful clay burner, and he who would succeed in this field of labor must expect "no excellence without great labor." He must bring brains as well as brawn to the task. By so doing he will show that there is no such thing as luck but that the forces of nature may be subdued and made to do the will of man.

BRICK MANUFACTURE NEAR CHICAGO.

BY D. V. PURINGTON.

In complying with your request for a brief description of the methods in use by the Purington-Kimbell Brick Company for making brick, I wish it distinctly understood that the Company makes no claim that these methods are original, or that they are exclusively their own.

There are several other firms who have adopted the same process, some of whom have more expensive plants, and some whose yards excel ours in convenience of arrangement. I do feel, however, that I have the right to lay claim to being the pioneer in the use of the Chambers' stiff mud machine, which has achieved so complete a success, in Chicago. The first machine of this kind was erected by Messrs. Purington & Kimbell, the predecessors of this Company, in the early spring of 1882.

It was placed on a yard that the previous year had operated seven horse-power machines of the kind so generally used along the Hudson River. The clay used was dredged from the Chicago River, and one season clearly demonstrated the impracticability of its use on the Chambers' machine. Taken as it was from the water, it required at least a year to dry out sufficiently to be available. The experiment was carried far enough, however, to prove that the hard, tenacious, blue clay which underlies our whole city,

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Read before the American Society of Civil Engineers, April 18th, 1888.

could be advantageously worked in its normal condition.

In June, 1882, Messrs. Purington & Kimbell secured another location on the banks of the Illinois and Michigan Canal, and located a second machine, designing to use the clay that had been dredged from the canal twenty-five years before. From its long exposure this clay was peculiarly adapted to the machine, and in the fall of 1882, the first machine, with engine, boilers, dryers, etc., was removed to the canal bank.

These two machines, one with dryer and one with out-door drying, made in 1883, 1884 and 1885, forty-six millions of brick. The maximum was ten millions on the machine with dryer and six millions five hundred thousand on the out-door yard. In the spring of 1883, this Company was incorporated and purchased the interest of Messrs. Purington & Kimbell, and, the clay becoming exhausted, purchased 47 acres of ground on the Rock Island Railroad, 14 miles from Chicago, and in the spring of 1886 erected thereon the works you have asked me to describe. The wisdom of going so far away from the city and endeavoring to compete has been clearly shown by the fact that the Company are able to deliver brick by rail to Chicago, and by teams to the building at a less cost than they had been able to do it from the yard in the city limits. The railroad company named the new station "Purington," and hereafter in this letter the new location will be known by that name. The clay here differs somewhat from that at or immediately around Chicago. It is much freer from limestone pebbles, and less of the consistency of india rubber, but it is very hard, although slightly granulated.

For the first six months it was obtained by the use of pick and spade. It was found impossible to secure eleven men who could mine and load sufficient clay for forty-five thousand brick in a day of ten hours. As the season advanced, and the bank became dryer and harder, dynamite was freely used to assist in "getting a fall of the bank." In July of that year our bills for dynamite amounted to $85, and our average day's work less than we had made since the introduction of the Chambers, and we came to the conclusion that unless some more economical plan was devised, the Company would go the way of dynamite.

Correspondence was opened with the manufacturers of steam shovels, and a contract made for one. At this point we committed the blunder that has been the bane of so many brickmakers, viz.: of trying to economize by getting machinery too light for its work. The expert who knew just what was needed, (?) insisted that a No. 2 was ample for our wants. Four weeks of worry and bother decided that we had saved at the spigot and lost at the bung, and we were glad to make the best terms we could in exchanging for a larger one. This one was built with a dipper intended to hold 1½ yards, but, on our suggestion, was changed for a 1-cubic yard size. It requires 2 yards of clay, measured as dug, in the cars, to make one thousand brick.

Our shovel will easily dig enough for two hundred and twenty-five thousand brick in ten hours, inclusive of time consumed in moving, etc.

The dipper cuts from 4 to 5 inches in depth, 3 feet in width and 25 feet from bottom to top. This cut will ordinarily fill the dipper with clay, thoroughly mixed, cut in small pieces, and the two yards are taken from the bank and placed in the car in less than one minute's time. The cars are drawn from the shovel to the turn-table, a distance varying from 100 to 700 feet, by horses. Until the present year, our cars have been of the style in general use by railroad contractors, a box holding 2 yards placed on a half circle for a dumping rocker. The entire weight and strain comes upon one point, a line drawn lengthwise through the center of the car. I have found in dumping from the steam shovel, or in drawing these cars over an uneven track, that there was a great liability to breakage. I have now adopted the plan of dumping or tipping the track. The frame-work of my track is made of oak, 4 inches by 6 inches in size. Under this frame is placed a shaft 3 inches in diameter, with three bearings in each length of 16 feet, with the car fastened securely to the track. The operation of emptying the clay from the car is simple, and it is almost impossible to break anything. Under the old system (Cockrell) one man was kept steadily employed repairing cars. The cars are drawn up by a hoistway from the turn-table to the machine house.

The contents of the cars are dumped upon a platform, below which stand two pulverizers, one for each brick machine. These pulverizers have never—and probably will never—come into general use, for the reason that so few clays, can be successfully worked by them. With us they seem to fill the bill exactly. The object of the machine is to tear the clay to pieces, by a sort of whittling, its chips resembling in shape and condition those obtained in sharpening a lead pencil. It consists of a hollow vertical cylinder, at the bottom of which is a revolving horizontal disk, moved by a vertical shaft, connected above to the motive power. In the horizontal disk are set a number of knives in the same manner as the knives of a plane, but with the cutting edges up. The slots in the disk in which the knives are set are also similar to the openings in a reversed plane. Underneath the machine is a belt conveyor. The top of the cylinder is on the level of the floor on which the clay is dumped.

It is the work of two men to shovel the clay from the floor into the cylinder when the disk is revolving two hundred and fifty times in a minute. The idea is to plane the clay in chips, pass it through the slots, and deposit it on the belt or elevator. It is then carried to the hopper over the brick machine. Around this hopper is a platform on which stands a boy, whose place it is to see that the hopper does not clog, and to add what water is necessary.

The brick machine is in charge of one man, who should be a tolerably good machinist, as well as a careful man of good judgment. The bricks leave the machine on the flat, but are immediately edged automatically. Three boys, from fourteen to sixteen years of age, take the brick from the belt and put them upon an iron car, each car containing five hundred and forty bricks. These cars are then taken by a man and run into the tunnels to dry.

There is nothing new or original about these tunnels, unless it is their length, 94 feet, and the use of an exhaust fan instead of a stack to remove the steam. Eleven tunnels, with a 30-inch fan for each two tunnels, will thoroughly dry fifty thousand brick in twenty-four hours. I am a decided advocate of artificial circulation to bring artificial drying to a point anywhere near perfection.

These tunnels should be filled before any are drawn out, and when a car is drawn it should be replaced by another. The grade is 1 inch to 10 feet. One man is sufficient to keep the fires in good condition, to draw out the brick when dry, remove ashes, etc.

In front of the storage tracks is a wide-guage track with a transfer car, on which the cars of dried brick are run to any portion of the 1,100 feet of kiln shed, Four men, who still retain the designation of brick wheelers, take the product of each machine to two setters. Our average for each machine in 1887 was forty-four thousand three hundred for each ten hours. I have given in detail the men actually engaged in making the brick and setting them in the kiln. As there are so many men whose work is divided on the whole four of our machines, I submit herewith the list and classification of our employes at Purington. I refrain from giving the wages paid, as that would vary in different localities and really does not enter into this comparison.

4 machine men.
4 " boys on platform.
8 men at pulverizer.
2 " hoisting machines.
1 engineer on steam shovel.
1 fireman "
1 craneman "
6 men in clay bank.
12 boys loading cars, handling cars, etc., with green brick.
4 men to put cars in dryer.
4 " fire dryers and take cars out.
4 " " " " [at night.
24 " setting and wheeling.
1 engineer.
2 firemen.
1 carpenter.
1 blacksmith.
3 laborers.
—
83 Total.

Thus it will be seen that eighty-three men and boys make, dry and set in the kiln an average of one hundred and seventy-seven thousand two hundred brick per day.

From 1883 to 1885, with one machine used with dryers and one with out-door drying, our average was one hundred and sixty-seven days for the latter and two hundred and fifty-four for the former. The cost of brick dried artificially is less than those dried out of doors. The longer the season and the steadier the job the better the grade of men who will seek it. I have refrained from entering into a detailed description of the Chambers machine, for the reason that it is too well known to brickmakers to need it. This Company pays every two weeks, and during its existence has never missed a pay day and never had a strike. Since its location at Purington, no intoxicated man has ever been seen on or about its premises. Its relations with its employes are never strained; and, while neither the Company nor men make any claims to foresight or sagacity peculiar to themselves, they do claim to have that perfection of an organization known as a union of the employer and employed. During the past year the Company erected a building 28x40 feet for the exclusive use of the men. They furnish heat and light, and the only restrictions placed upon the men are, that it shall be closed at 10 p. m., shall be kept clean and orderly, and that no intoxicating liquors shall ever be taken into it.

From a portion of the above it may be inferred that the executive officers of the Company are fanatics on the temperance question. This is not the case, but they are fanatical on the intemperance question.

The question of burning brick with crude oil has engaged the serious consideration of this Company for a year past, although it is only three months since their first experiments were made. The developments thus far in this new branch of a science, so all important to the brickmaker, are too crude and new to warrant any extended remarks. All who have tried it agree that as a fuel it comes nearer perfection than any other they have tried or known of, except it be natural gas.

All who have looked into the matter at all agree .that hot oil, hot steam and hot air are necessary. No two agree, as yet, on the necessary quantities of either or the proper method of mixing them. I have now burned six kilns or about two million one hundred thousand brick. Thus far we have not had a bad kiln, and my experience justifies me in saying that I feel much more certain of a good burn than I ever did with wood and coal. The cost of burning with us is 35 per cent. less with oil than with wood and coal, and with large kilns the cost of labor is much less; two men will easily handle a kiln of twenty arches. No cold air is admitted and the checked, cracked arched bricks resulting from such admission are avoided. It is a promising field for experiment, and within six months, if we meet with no drawbacks, I hope to be able to write and talk more intelligently in regard to it.

In reply to questions Mr. Purington said: "My drying tunnels are 36 inches wide by 48 inches in height, and the average amount of coke used during the past two years in drying brick in twenty-four hours has been one ton to fifteen thousand brick. This coke costs me f. o. b. cars at Purington, $5.55 per ton. The expense is about equal to anthracite coal at $6.25; but I prefer the coke for the reason that the gas in the coal is more destructive to the iron cars. I should, perhaps, have mentioned that I have a steam dryer that, with a few changes, I think will accomplish better results than the hot-air dryers. Of this, however, I prefer to write when I am satisfied what it will do. In a general way, let me say there are many clays that can be successfully dried with a steam heat that cannot be with heated air passed over or through a heavy fire. While I regret very much that my time is too fully occupied to write as intelligently or exhaustively as the subject deserves, I desire to congratulate the progressive clay-worker that a body like yours deems our avocation of sufficient importance to give it so much attention. I have given to it seventeen years of the best of my life, and feel that I, with others who have tried so hard to place this industry in its proper place among the mechanical arts, have reason to congratulate ourselves that we are in the future to have the active co-operation of your Society.

ALUMINUM.

A few years ago, an American patent was obtained for the reduction of alumina to its metalic form by the intense heat of an electric furnace. A good degree of success crowned the enterprize, at least so far as the production of an alloy with copper at a fair price. This is one of the most valuable forms in which this new metal can be used. Recently a patent has been granted in Switzerland for a process similar to that secured by the American patent, differing only in its details.

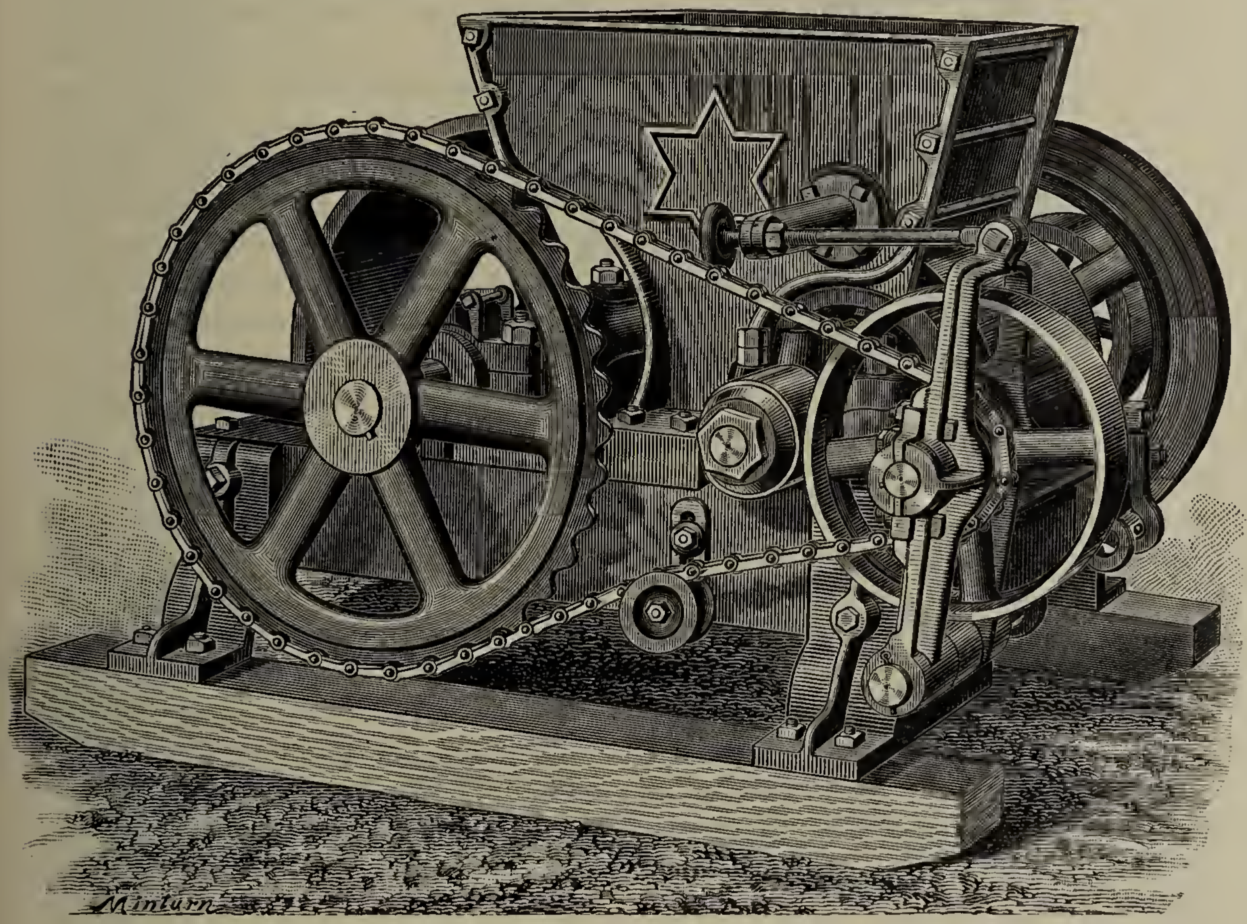
This Swiss furnace is operated by the largest dynamo ever constructed, giving double the electric quantity of any machine ever before used. But the current is of low tension, it being the object to use the electro-chemical quality of the immense current rather than its dynamic property. By this means it was hoped to separate the pure metal from its oxide directly. In this, however, the theory failed, but the giant furnace produces the alloy with copper with wonderful facility. The daily production of 10 per cent. aluminum bronze is reported to be about 7,000 pounds—equal to 700 pounds of pure aluminum.

Every experiment strengthens our faith in the ultimate success of the introduction of aluminum, in some of its forms, into common use as one of our most valuable metals.

The power that runs this huge dynamo is estimated at 1,000 horse-power. It is furnished by the river Rhone.

THE POTTS DISINTEGRATOR AT THE FRONT.

The invention and introduction of the Potts' Disintegrator to the clay-working industry was a new departure in the preparation of clay for the manufacture of many kinds of clay goods. "Nothing like it" had gone before. It was unique, original and distinct. In fact, it was the first machine ever offered to clay-workers that would thoroughly pulverize the clay, which is done by cutting and dividing the clay into fine particles. The clay after passing through the Disintegrator is in the best possible condition for tempering; an open, uniform mass, soft to the touch and thoroughly mixed. Clay when passed through rolls alone, is compacted into cakes and difficult to temper evenly throughout, leaving here and there hard lumps with the best tempering or pugging that can be done. In the use of the Disintegrator the best possible separation of the clay is effected.



The result has been so satisfactory that other manufacturers have tried to devise machinery that would do a like effective work but in vain.

The Potts' Disintegrator has been improved so as to make the working complete but in no sense has the original principle been abandoned. It has been a success from the beginning and with the added improvements it stands to-day without a rival.

The accompanying cut illustrates the Potts Disintegrator, Style "A."

The following testimonial attests the excellence, efficiency and capacity of this remarkable machine:

OFFICE OF
BERLIN BRICK COMPANY,
Manufacturer of
Pallet Building and Pallet Sewer Brick.

BERLIN, CONN., May 6th, 1889.

Messrs. C. & A. Potts & Co., Indianapolis.

GENTS—We have much pleasure in informing you that your Disintegrator has worked in an entirely satisfactory manner and done all you claimed it would do since we commenced using it this season. We have geared it so that the rolls make respectively 13 and 800 revolutions per minute and it throws out all stones, thoroughly pulverizes the clay and more than that, feeds the brick machine which we are running at the rate of 13 moulds per minute. We have already manufactured some 800 M brick this season and they are considered by all who have seen them to be superior to any others manufactured in this section, for which superiority we give credit to the Disintegrator.

It does not wear faster than could be expected, considering the work it has to do and we certainly think it is the best machine of its kind in the market.

As to your Mould Sander, we can only say that we could not ask for a machine that is nearer perfection both as regards simplicity and efficiency. It does not and cannot leak. The moulds do not and cannot clog or catch, and we are satisfied with it in every way.

You are at liberty to use this in any way you may see fit and we shall be pleased to answer any inquiries, or show the machine at any time to any one you may send here.

We are,
Yours Truly, BERLIN BRICK CO.

The manufacturers of this machine, Messrs. C. & A. Potts & Co., of Indianapolis, Ind,, (see their ads. on pages 354, 355, 358 and 359), solicit correspondence from all clay-workers and will cheerfully mail descriptive circulars to any of our readers.

THE MANUFACTURE OF SEWER PIPE.

The following is a description of the method of manufacturing sewer pipe followed by the Delaware Terra Cotta Co., as given by Mr. Frederick H. Robinson before the Engineers' Club of Philadelphia:

The works are situated on Brandywine Creek, between Herald and Eleventh Streets and close to the Philadelphia, Wilmington and Baltimore Railroad. They are equipped for the manufacture of all the standard sizes and shapes of sewer pipe, as well as of other work in terra cotta, and of fire brick.

The material of which the pipe is made is composed of three ingredients—two kinds of clay and a sand and clay mixed. The first is a very strong clay obtained from brickyards in the northeastern part of the city. It underlies the clay of which bricks are made. The second is a strong clay containing a red coloring matter, and is obtained from the south side of the Christiana River in New Castle Hundred, near the bridge on which the Delaware Railroad crosses the Christiana. The third ingredient is a material composed of fire clay and sand is obtained on the Christiana River in New Castle Hundred. These ingredients are mixed in the proportion by measurement of two parts of the strong clay first mentioned, one part of the clay containing the red coloring matter and one part of the fire clay and sand; made in these proportions, the mixture is placed in the pan where water is added. The wet pan is a shallow, circular iron pan in which the clays are crushed and mixed by two iron wheels following each other on edge around the pan, driven by a horizontal axle attached to a vertical shaft. This pan is placed on the ground floor.

After the materials are properly mixed, this clay is turned by a suspended shovel into the buckets of the elevator, which are attached to an endless band in which it is raised to the third floor of the building.

Projecting from the third floor toward the second, is the casting which contains the iron mould for the pipe. Into this the clay from the wet pan is thrown and an iron plunger, moved by the piston of a steam cylinder, which piston is attached to the upper end of the plunger rods, descends vertically, compressing the clay in the mould below.

After the clay is thoroughly compressed in the mould, an iron table under the mould, attached to the upper end of a piston passing below the second floor and forming, as it were, the bottom for the mould, descends with the pipe standing upon it. The alternate upward and downward motions of the piston which moves the plunger, and the piston which moves the table, are controlled by the operator on the second floor, where the pipes are removed from the mould.

Pipes under five inches in diameter are, when taken from the mould, immediately removed to another part of the second floor where they have placed in them a wooden frame of the proper length to which their ends are trimmed off and then smoothed with leather. As those over five inches in diameter come from the mould, they immediately have their spigot ends trimmed off and are then taken by an elevator to the first floor where their ends are finished up. These, with the smaller pipes from the second floor are placed on end on the drying floor of the first story of the building, where they remain from three to six days, when they are ready for burning.

Branches are made by placing the branch piece, while damp, upon the main pipe and then trimming and shaping them.

Traps are formed by hand in plaster of Paris moulds which are made in halves, dividing lengthwise.

The walls of the kilns are of brick and are 13 inches in thickness. The kilns are circular, the largest being inside, 22 feet in diameter and 8 feet high to the square, mounted by a dome.

The kiln is filled with pipes from the drying floor placed on end. It is fired from eight fireplaces at equal distances around the kiln. Gas coal is used. Inside the products of combustion pass through short vertical stacks toward the top of the kiln, whence they are beaten back among the pipes and finally escape through a flue built around the kiln near the bottom and pass in an underground flue to the stack.

At the proper stage of burning, which is ascertained by small test pieces of clay which may be drawn and examined, the attendant passes three times around the kiln and each time throws into each fireplace a shovelful of common salt. By this the pipes are glazed.

After the sealing of the kiln, three days are required in which to fire up and burn, and three more in which to cool off and remove the pipes which are inspected and are then ready for the market.

THE J. M. BLAIR BRICK CO'S WORKS NEAR CINCINNATI, OHIO.

The following brief notes made during a recent visit to the extensive brick works of the J. M. Blair Brick Co., together with the ground plan illustrated, will doubtless be of interest to our readers. They are making this year some 20,000,000 brick for the Cincinnati market and vicinity. Last year their product was 13,000,000 when they were burned out. But with their characteristic energy they have rebuilt their works and resumed operations early this season.

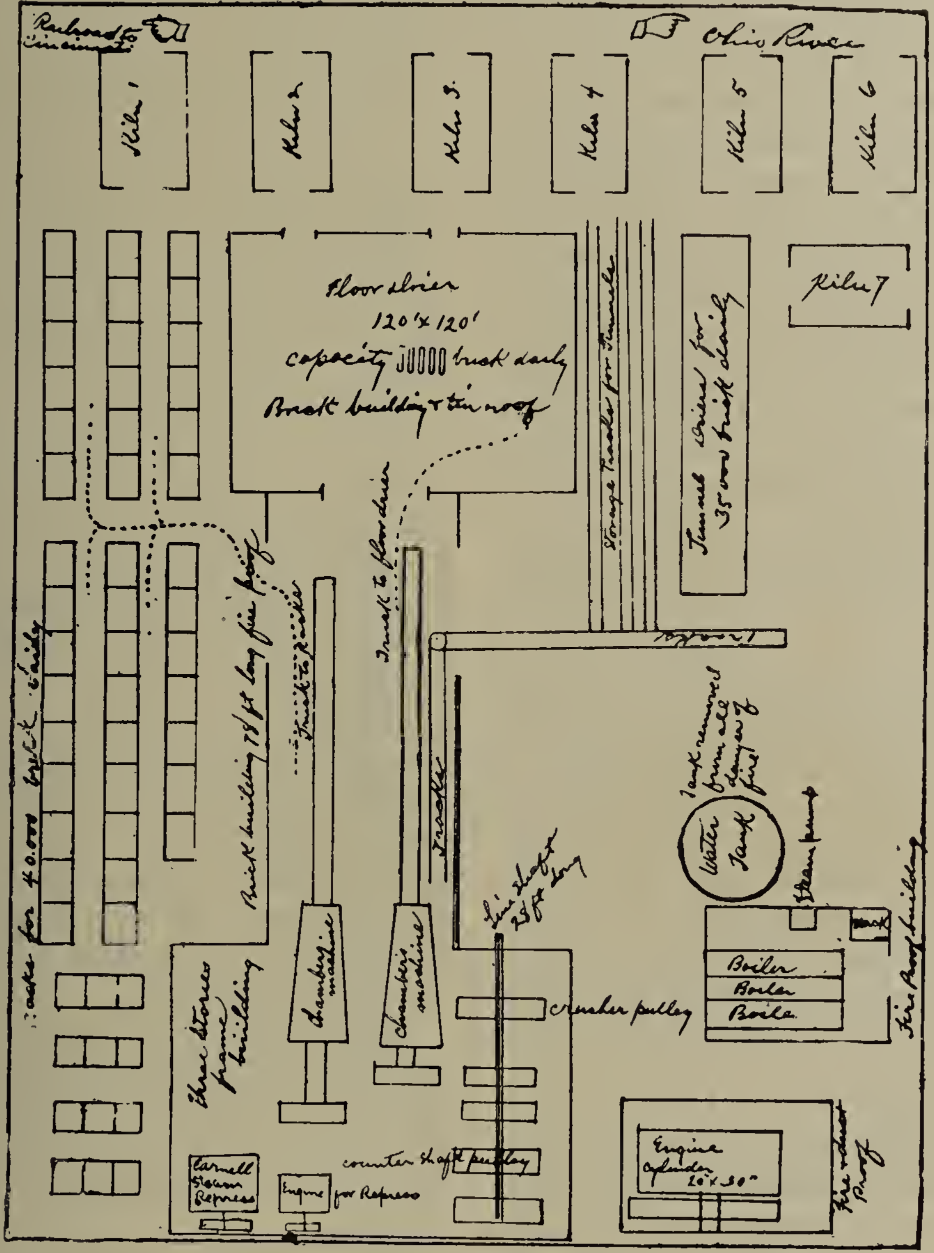
Their works embrace all modern improvements and the arrangements in some respects are unique. They were rebuilt under the direction of B. W. Blair, the General Manager of the works, and who will be remembered as one of the efficient Vice-Presidents of the National Brick Manufacturers' Association. Above we present to our readers the portrait of this well known gentleman to whom we are indebted for courtesies shown during the visit as well as at other times.

Mr. Blair, however, is disposed to give credit in part, for the plan of the present works to May, Purington & Co., of Chicago and acknowledge special obligation to C. S. Purington of that firm for valuable aid and suggestions in planning their new works. The Blair Company have 80 acres of excellent clay (they claim the finest clay in the world) thirty feet deep situated on the Ohio River, at Blairville (the name of their place) twenty miles above Cincinnati.

The clay is dug and loaded on dirt cars with a Marion Steam Shovel digging clay enough for 110,000 brick per day supplying two Chambers Brick Machines and the shovel is idle a good part of the time. The clay in cars is drawn by a mule to an elevator made by the Link Belt Machinery Company, of Chicago. The Elevator consists of a series of pans on wheels that run on tracks from the clay bank to the granulator in the top of the building. The pans of the elevator interlock and form an endless trough which can be stopped or started at will by means of a friction clutch on pulley that runs elevator, so that if the granulator is full of clay the feeding from elevator can be discontinued. Mr. Blair informs us that the elevator is a great improvement over elevating the cars into the building. From the elevator the clay passes into the granulator where it is thoroughly cut up and prepared for the pulverizer or crusher into which it next passes. And they claim that here is one of their *greatest improvements*, that of feeding with *one large* crusher, two large Chambers Machines and supplying them with clay for from 110,000 to 150,000 brick per day, which is done by means of two inclined planes under the crusher, an inclined plane running to each machine. At the top of inclined planes there are two doors on hinges. When one machine is to be fed the doors are thrown back to receive all the clay for that machine. When two machines are to be fed one door is thrown to receive one-half the clay of the crusher from machine and the other door thrown to receive the other half of the clay for the other machine. From the crusher (which is ten feet above the brick machines) the clay falls into the hopper of the brick machines and comes out on the other end beautiful bricks.

The Messrs. Blair dry a part of their brick on a large dry floor 120x120 feet (square) having a drying capacity of 50,000 brick per day; another portion of their brick are dried in tunnel driers having a daily capacity for 35,000 brick and in summer a third portion of their brick are dried by the rack and pallet system with capacity for 40,000 brick per day. On their yard each of these systems of artificial drying is a success.

Mr. Blair says that since using the granulator in conjunction with a crusher or pulverizer, the quality of their brick in smoothness and squareness has been improved one hundred per cent. There are no lumps now in the brick. They ship most of their brick to the Cincinnati market on their own barges each of which holds 140,000 brick. They have sent, though, during the past few years 1,300,000 brick to Ironton, 140 miles up the river from their works; 1,200,000 to Maysville, 60 miles from works; 1,400,000 to "Addyston," the new iron works 30 miles down the river from their works, so that their product is in general demand not only at the local market of Cincinnati, but far away where they would expect opposition, except only for the superiority of their product.



After spending a pleasant afternoon with Mr. B. W. Blair, we reluctantly bade him good-bye, being satisfied from his conversation and the results we saw that he had made a thorough study of modern brick manufacturing.

THE VALUE OF TIMELY READING.

We had occasion quite recently to write Mr. J. W. Penfield for some facts in regard to the progress of tile drainage. After briefly reviewing his early experience, how he first learned of the underdrainage of land by reading the Gennessee Farmer, the Ohio Farmer, American Cultivator and Greeley's Tribune, he says: "To illustrate the value of Agricultural reading and for the encouragement of young men, I wish to say that whatever of success in life we have attained, it had its foundation in reading agricultural papers when I was young. And I find it is not too late to profit thereby, as we find many valuable hints which we can utilize; for instance, we have been constructing a 12-inch sewer over 100 rods long about nine feet deep to drain a valuable clay bed recently purchased, and having read in the Drainage Journal a hint from some one about covering the joints of large tile with tar paper to prevent dirt from entering, we tried it and find it of great service. We had a bed of quicksand full of boiling springs and a large quantity of water to go through, and when we wrapped the joints with tarred paper we excluded not only the quicksand but most of the water—a very desirable thing to do where the drainage of the land through which the ditch passes is not desired."

Information acquired by reading when we have a leisure moment is so much capital to be drawn on in the future when the occasion arises demanding its use. Some people think their time wasted if they read a suggestion or experience that they cannot utilize at once to their profit and say "its no use," "its book learning," &c. Such people are quite ready to say "it don't pay to take and read a paper" and so they go through life, stumbling and catching here and there. Now and then they point to Jack Jones or Billy Smith and say with a degree of ignorant pride, "See what he has done; he can't read, even." We reply that there are men fitted by nature to hoard up their daily earnings until they amass wealth, like many other animals that we can name which pile away nuts for winter, that are of little benefit to mankind. But who can tell what Jack Jones or Billy Smith would have accomplished in life if they had had a liberal store of information from daily readings.

A valuable suggestion may not be needed for years but when it is, and is utilized, it may be worth many dollars—it may be the key to success in the supreme moment.

Again, we hear it said "there is Prof. Wiseman, he is a walking library and he can hardly keep soul and body together." Very well, that may be. Men may have capital an fail to use it. Better that than to have no capital to use. The world is badly mistaken, sometimes, in its measure of men. There be some that the world judges to be failures because they fail to make money, when, in fact, they are of incalculable value in the uplifting influence they have upon society in another and infinitely higher sense.

But the rule is, that information acquired by using the leisure moments in reading valuable papers or books will inure to the success of sensible people.

The Soldiers' Home at Leavenworth, Kans., are preparing for the extensive manufacture of brick this season and are erecting large works. Col. A. J. Smith, Governor of the Institution recently made an extended trip for the purpose of investigating the different machines manufactured, and placed orders for the machinery. The machinery selected was a Penfield No. 10 D, with pug mill, four roll crusher, elevators, dry cars, barrows, etc., all purchased from Penfield & Son. They will also use a Penfield steam Dryer. They expect to manufacture paving brick, also building brick, hollow building material and ornamental brick and are now busily engaged erecting their machinery and buildings.

A city girl exclaimed, on seeing a watermelon growing: "My! I always s'posed watermelons grew in the water."

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN BY CORRESPONDENT. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Up the Hudson.

Editor Clay-Worker:

The making of brick in Haverstraw began unusually early this year. Pursuant to instructions from headquarters I paid a visit about the middle of April to the little village situated so picturesquely on the Hudson, and found that matters were much further advanced in all the yards than could reasonably have been expected by the most sanguine. There was only one yard not in operation when I called, that of Sherwood & Baum, and this fact was due not to the weather or to the men, but to some unexplained trouble about the lease of the premises.

No one who has never paid a visit to Haverstraw can have any idea of the way in which the brickmaking industry has wrapped itself up in the destinies of the little town of over 6,000 inhabitants, more than half of whom earn their living in and about the yards, nor of the immense size and importance of the industry. In and around Haverstraw from the Hook mountain, which is about opposite Sing Sing on the east side of the Hudson, and near Rockland Lake, to Grassy Point, which is opposite Crugers—an area of about three miles—no less than between 350,000,000 and 400,000,000 of brick are produced yearly. Of the immense amount of capital invested there is no need of speaking. Each yard represents thousands of dollars, and from the fact that the brickmakers are the capitalists of the town directing the destinies of the banks and other moneyed establishments, it is easy to draw the inference that the industry is in a flourishing condition.

The first yard that I visited was that of John Derbyshire, whose regular quota of men in the busy season is about 55. The full gang was not yet on but molding was going forward briskly. About 60,000 brick a day are turned out here, eight million being the output for the season. It is a four machine yard and is held to be one of the best equipped along Haverstraw Bay. Wm. R. Pitts, the Superintendent, escorted me about, and I was much struck with the simplicity of the covered yards. In cases of sudden rain, the three levers can be used to advantage in shielding the bricks in less than five minutes. An ingenious contrivance in use here in case of fire is the placing of a valve and nipple on every other post, or every sixteen feet throughout the covered yards. These connect with hose, and in case of the eaves catching fire, the brick can be flooded in a moment. New machines—two of Wiles' and two of Vervalen's, were put into these yards last season and as a result no changes are to be made this year. The blue clay deposit from which the Derbyshire yards are kept going, is exactly on a line with the village and is said to be the greatest deposit of the kind in this part of the country. There is four feet of yellow clay and the rest of it is solid blue. When an artesian well was sunk here some years ago it was found that 110 feet of the 165 sunk was all solid clay. As it is, the vast amount taken away already can hardly be noticed and Mr. Pitts told me that even if the capacity of the yards were increased to 12 million bricks yearly the deposit would surely last for 50 years more.

"The opening this year of our yard and of all the yards along here," said Mr. Pitts, "has been much earlier than for a number of years past, and I think that we have every prospect for a very favorable season. There never was a time when there was such a scarcity of brick at the opening of the season, and since 1870 I have never seen so many new buildings projected as there has been this year."

From Derbyshire's I went a little below the village to Denton Fowler & Son's yards. Here I found both of the firm, who are old subscribers for the Clay-Worker, and enterprising and experienced brickmakers, hard at work putting in their new covered sheds. They had started up molding on the 16th of the month, with about 70 or 75 men, their full force consisting of about ten men more and their output consisting of between 80,000 and 100,000 brick a day. Five Vervalen machines are in active use here. Last season the firm tried the pallet system of laying the bricks in racks, but this year they will try covered sheds, which, in spite of the extra expense, will, they think, work better in the end.

Theodore Frederick, whose yard is above that of John Derbyshire, started in early this year, with about 50 men, which is a little less than the regular force. Mr. Frederick is a regular subscriber to the Clay-Worker, and seemed to be fully up to the times. He has invested between $2500 and $3,000 this year in a new plant, pit and tool sheds, and he expects to put up other new sheds soon. Seven millions of brick a year, or about 22,000 daily, is the regular output, and the three Vervalen machines are kept going steadily. One of the three machines is new and the facilities of the yard for turning out better brick have been increased.

Mr. Frederick in common with a number of other brickmakers has recently put in the city water, which is a great improvement over that of the river, as it leaves no scales on the boiler nor eats into the iron as the salt water does. He also has the fire sprinkling system which is in use at Derbyshire's.

Next to Mr. Frederick's yard, as one journeys up along the Hudson is that of Dolan & Co., where moulding was begun on the 10th of April. The regular force here is about thirty and four or five millions are turned out annually by the two Vervalen machines which are in constant use. Both of these machines are new this year.

T. Maguire & Sons started in on the 15th with 60 of their 85 men at work. They have eight yards and five Vervalen machines which have been put into perfect repair for this season's work. Eight millions is the regular output here, but 12 and 13 have been turned out during good years.

Among the first yards to open up this season were those of Murray & Morrissey, which adjoin Maguire's. The regular force here is forty men and six million brick are made annually on two machines.

Archer Bros. keep 40 men at work and of the six Wiles machines which were running when I called, two are quite new and contain all the latest improvements. Fifteen millions is the yearly output.

At Snedeker Bros., whose yard adjoins Archer's, I found that the pallet system which had been put in last year was warmly praised for its effectiveness and that it was to be continued. This firm has 25 of its regular force of 40 men at work. It runs two machines and turns out between four or five millions every year.

The first yards to start up this year were those of Peck Bros., where work was begun on March 27th. It proved to be a little too early, however, and the force had to lay idle for a full week after starting, while the frost lasted. Forty out of the regular force of fifty men were at work, and here again the pallet system was giving perfect satisfaction. Two machines are kept steadily at work and the output is about 75,000 brick a day. Here I learned that the most needed improvement and the one which Mr. Frederick and others of the brickmakers had adopted, was the use of reservoir city water, instead of hydrant city water. This improvement had only been made by the officials of the place this winter and that all Haverstraw will soon be using it is of course a matter of little doubt.

At the yards of B. J. Ellison & Co., which opened up on the 16th, the shafting and machinery has this year been put into thorough repair, while of the regular force of 100 men, 80 are hard at work. This place keeps 5 machines going steadily and turns out twelve millions of brick every year.

On March 27th, the same day that the Peck Bros. started up, work began at the yards of Bennett, Warren & Scott, and when I visited them I found that they were already burning brick in the kilns. No less than 140 men are kept at work here regularly and fully 23 million brick are made yearly. To the five machines here the firm are adding patent mould sanders this year.

The two yards of ~~A. W. Keenan~~ and of Ward & Keenan adjoin Bennett, Warren & Scott's. They began moulding on the 16th inst. and 36 of the regular force of 50 men are at work. The four Vervalen machines in use underwent a general repairing before the season opened.

After passing Keenan's yards one arrives at the yards of the largest brickmaking concern in Haverstraw—The Diamond Brick Co. This is a stock organization. Ira D. Hedges, who is also the President of the National Bank in the town, is the President, Geo. H. Smith is Treasurer and W. H. Carr is the Secretary. The company is a regular subscriber to the Clay-Worker, and Mr. Carr is one of the best known brickmakers in the country. Over half of the regular force of 400 men started into work on the 16th of April and matters were progressing favorably when I made my visit. This is the only establishment of its nature in Haverstraw that burns oil and I am credibly informed that it introduced that factor into the art of brickmaking. A large tank near one corner of the yard has a capacity of 3,000 barrels and the company is finding the use of the oil a saving. Twenty machines are now run here and the annual production of the yards is between 45 and 50 million. At the three separate yards of Richard Crowley, Thos. Dinan and Dennis Maguire, work had not begun when I called as the men were busy putting in a new engine and boiler to be used by all three firms. It was expected that the yards would start about May 1st. Altogether they have a capacity of fifteen millions yearly.

D. Fowler, Jr., & Co's yards opened up on the 15th of April, six machines being kept steadily at work here, and the output averaging from six to eight million.

Near Grassy Point, where I brought my tour of investigation to a close, I found the three yards of M. F. Washburn the scene of much activity. Considerable repairing had been done before the opening of the season and one of the old machines had been replaced by a new one. About 175 out of the regular force of 200 men were at work and I learned that the 11 machines in use turned out an average of 19 or 20 millions of brick a year.

Back of Grassy Point and between that place and West Haverstraw, on the banks of the picturesque Minneseonga Creek, which is a branch of the Hudson, two new yards are going up. One of these will be run by Washburn & Fowler on the pallet system. It will contain five machines and turn out 9 million brick yearly. The other will be that of Sharkey & Sons and will be a four machine yard with a capacity of eight or nine millions. It will also be run on the pallet system.

BRIC-A-BRAC.

Another Way of Burning.

Editor Clay-Worker:

I have been reading the letters in the Clay-Worker with considerable interest and would like to say a few words about burning. I notice that no two burners burn alike, and although I don't claim to have better plans than anybody else, I can get good burns by the following methods:

Begin water-smoking by placing two pieces of split wood in each arch and kindling fire on them. Fire slowly for eight or ten hours, then increase the fires sufficiently to start water-smoke rolling all over the kiln. When the top of the kiln shows water-smoke to be leaving the heads. begin working the fire to the center, but keep a little fire in the mouths of the arches and continue this until the kiln is entirely water-smoked and in good condition for heating. Being ready to turn one side we put a couple of pieces of wood in each arch and close the head, then fill the mouths of the arches on the other side, placing a sheet iron door aside of each arch. We fire slowly and widen the draft so that in about twenty-four hours the arches will be hot two-thirds of the way across. Hold to required heat until the head is down and the settle will slope across the center. After changing, fire last head slowly for six or eight hours until the draft is up next to the casing, then widen and burn same as on first till done. We build kilns with a slow draft and never close the mouths of arches unless there is a gale of wind or we want the fire to burn down ready for rustling.

I thought I would be generous to the public last year and make larger brick, using moulds 8 9-16x4 3-16x2 5-16 in size, but have got enough of that and have ordered new ones the old size, namely 8½x4⅛x2 9-32 inches. J. H. H.

Astoria, Ill.

The Village Brickyard.

Editor Clay-Worker:

Some twenty odd years ago a friend of mine in the brick business, in working over his field, had several poor burns from a certain north corner of the land caused, his burners stated, by the peculiar quality of clay in that portion of the yard.

At another time my father scalped the sod off, and leaving six inches of soil to mix with his four foot bed of clay, the foreman claimed so weakened the clay as to make all the arches melt, and so, in the experience of nearly all of us, instances are reported wherein the silent clay is variously vilified and all because that same clay has not been questioned in a manner and by a means by which it is capable of telling the truth. To show how important it is to appreciate the truth, that in the mud is only dormant, waiting to be questioned, my friend above named worked out his bed and abandoned the business because of the above poor burns, leaving the 30 acres adjoing his old corner, (which I am now working,) as worthless. Yet to-day I am making better brick than he ever did, with almost uniformly good arch brick, and have his hearty congratulations freely extended thereat.

As well known, when we have a case in court it is to our interest to employ a lawyer in order that all the witnesses may be properly questioned, for it is one of the most difficult feats in life to make another man tell the truth, the whole truth, and nothing but the truth.

Well, we are in the business of burning clay; we want to know if it will make good brick, or rather, as we have brick to sell, and of course they are good and first-class in every respect, we want to know if our clay field is not capable of making a better brick than our neighbors are able to produce, and then we shall have a better chance of trade than they have.

In a former communication it was stated that a burned brick made from an average of all our various clays, weighed 75 ounces, and that our brick mould was 4½x9x2⅜.

The following samples all made in the same mould and burned near the center of the kiln, show some points of general interest to the craft:

Sample No. 1. Clay two feet under ground, pure, medium to strong, brick 8½ inches long, weight 77 ounces and quality suitable to pave, with fair ring. Our own yard.

Sample No. 2. Clay two feet under ground, rough, slaty, dark red, with probably a large proportion of iron, brick 8⅛ inches long, weight 87 ounces and thoroughly vitrified. Other samples of this clay set in our arches entirely mis-shapen and full 9 inches long. Clay taken from an abandoned brick district in northern New Jersey.

Sample No. 3. Bank sand six feet deep; a fine, rich yellow sand used by us for moulding common brick; brick length 8⅜ inches, weight 56 ounces; quality, weak and rotton. Sand from under our clay beds.

Sample No. 4. Clay three feet under ground, strong, smooth, pottery clay; burns pinkish white; brick 7⅞ inches, weight 72 ounces, and quality a strong, perfect metalic ring. Our yard.

Sample No. 6. Rich garden soil from clay land, brick length 8⅛ inches, weight 63 ounces; quality, weak metalic ring; medium strong brick. Our yard.

All the above samples burned in Philadelphia, open top kiln. Of other samples of the same clays set in the rounding of the arches, all stood the fire without any indication of slag except No. 2, noted above.

From these samples and others made in a similar manner, I have learned that our clay will take an addition of fifty percent of the sand that under it occurs; that all the top soil left on and mixed with the clay has no appreciable effect on the quality of the brick, and that neither our top soil or sand will make our clay more liable to slag. Here we have brick weighing 77, 87, 56, 72 and 63 ounces each, all made the same size, burned the same quality, in the same kiln, only differing in material. The 56 and 63 ounce undoubtedly make weaker brick, but it is very important for us to know that both will make brick—that neither will slag in the fire—and hence when the burn is poor that it is not the clay's fault or our fault, but the fault of the man who neglected his fire—went to sleep, woke up, and tried to make a big show of doing something by morning when the boss might be around. Very often the silent clay is made to slag, when, if we could see the truth, the slag would be very close under a man's hat rim.

A VILLAGE BRICKMAKER.

A Letter From England.

Editor Clay-Worker:

One thing surprises me much, that you, with your very large number of splendid advertisements, don't publish an English edition of your paper with a view to bringing American machinery before the English brickmakers. I will give your machinery men credit for producing some exceedingly useful machines, and I believe they would sell in the English market if they could compete in price with the English makers. Some of the dry clay and semi-dry machines are especially useful tools, and I think are superior to the bulk of the English-made, and turn out more bricks. There are also some very handy plastic, wire cut machines (which you call stiff mud machines), and I believe they would sell readily. But in your cutting off tables you are a century behind us. In England you would find hundreds of tables somewhat similar to those advertised by you, out of use. How it is your machinery men produce such handy machines and old, obsolete tables, I am at a loss to understand. Now, I know I shall get rapped on the knuckles for this, and your machinery men will say I "have an ax to grind," but they will be wrong, all the same.

Some years ago a gentleman named Murray patented in England a cutting off table, and this table is now in use in nearly every wire cut yard in England. "Ah! that fellow is Murray's agent, and gets a commission on the sale of the table," is what your advertisers will say; but they would be wrong again. Murray's patent has expired and there are fifty places in England at the present moment where these tables are made, and anybody can make them. They are known as a side delivery table, and cut off and deliver on a board, ten bricks at once, without any handling at all.

To a plastic wire cut brickmaker, this table is worth its weight in gold. It would be of no use for slush machines or dry clay or semi-dry clay.

Your makers also manufacture some very good pipe making machines, hand-brick presses, stock-brick making machines, slush machines, all of which would sell if the price was right. But there is one great thing to consider; the salesman must know the brick trade and must understand the districts in which the various sorts of clay is found. For instance, it would be no use trying to sell a dry clay or semi-dry clay machine in Essex, Kent, Sussex or Middlesex, because there is no clay there that will grind, and it would be folly to try and sell a slush machine in Staffordshire Worcestershire, Lancashire or Yorkshire, because the clay is not suitable; neither would it be any use to take a plastic wire cut machine on the South Coast. A salesman must understand the geology of the district before he knows what machinery to recommend.

One of your advertisers (Chambers Bros. & Co., of Philadelphia) had one of their very good and useful horizontal plastic machines in the American exhibition in London, but they made one mistake—their salesman was an American and did not understand the language of the English brick trade. I spent close on three hours with him one afternoon in the exhibition, and had it not have been that I had read the Clay-Worker I should not have understood what he meant. He talked about stiff mud machins, slush machinery, spiral cut offs, automatic cut offs, tempering devices, sanding chamber, etc., all of which was Greek to an ordinary English brickmaker who would be too proud to show his ignorance by asking what he meant. There are square miles in the midland counties of England you could not get a brick sanded on the outside if you would give its weight in gold for it, and square miles in the southeast of England where you could get very few but this sort.

Now, Mr. Editor, I am going to have a shot at you. How is it there are so few brickmakers and clay-workers advertisements in your paper? Surely very many large brickmaking firms manufacture fancy bricks, ornamental squares, trusses, finials, ridge tiles, chimney pots, drain pipes, stable floor bricks, gutter tiles, &c., &c., and issue to their customers illustrated pattern sheets. Why don't you follow the example of the English Pottery Gazette and distribute these pattern sheets by stitching them in the Clay-Worker and charge a certain sum per 1000 for the distribution? These pattern sheets would get into the hands of thousands of people (architects, engineers, draughtsmen, builders and others) where the makers themselves could not hope to get them, besides saving them the cost of postage. Oh! Mr. Editor, I thought all Americans were sharp.

Now, if you fall in with my suggestion and publish an English edition of the Clay-Worker, you ought to get a lot of English advertisements which, as a matter of course, would de published in both England and America, besides bringing the English and American brickmakers closer together and make them understand each other better. R. S. BLUCK.

Peterborough, England.

A Promising Field.

Editor Clay-Worker:

We are running a brickyard at this place with capacity for manufacturing eight to ten million brick per annum and have a rapidly increasing demand. Our yard is located on the banks of the Mississippi River and on the line of the L. N. O. & T. R.R., "Mississippi Valley Route" giving us good shipping qualities. We make nothing but the ordinary building brick which burn to a beautiful cherry red. The nature of the clay is mentioned in an article by Jno. W. Crary in your April number. We are having a constant enquiry for pressed brick and ornamental work for facing and building fronts. There is also a growing demand for tile such as that used by farmers and planters for drainage purposes. They have just commenced using it and soon the demand will be very heavy.

Our brickyard tract covers about 300 acres of land immediately adjoining our city and we are desirous of organizing and starting a stock company for the manufacture of the different clay goods referred to above, but the difficulty that we labor under is that we have no one in this section experienced in the manufacture of that class of goods. We desire to correspond with any experienced party who would like to go into an enterprise of this kind, we furnishing one-half the necessary capital. Of course it must be understood that the party or parties who will go into this business are experienced in the manufacture of these goods and shall come here to take the management. What we have reference to is the manufacture of repressed or facing brick, ornamental clay work and drain tile.

GARIG, REDDY & HART.

Baton Rouge, La.

Standard Size for Bricks.

Editor Clay-Worker:

The St. Louis Iron & Machine Works, in establishing a special department for making moulds for dry clay brick presses find some annoyance in the fact that the sizes of brick differ materially in different cities and often are not alike even in the same neighborhood. Such diversity makes it impossible to carry moulds in stock and as most people never order anything until they find they cannot do without, the delay in manufacturing is often serious. Considering that bricks are largely shipped, it would seem that uniformity of size is of the greatest importance.

Letters of inquiry on this subject brought the answers given below. Could not the Clay-Worker agitate the question of uniformity? S.

CITY.	SIZE.			REMARKS.
Cleveland	8	4	2	
Boston	8	4	2¼	Average. As many sizes as makers
Detroit	8	4	2½	
Portland, Maine	8	4	2½	
Wilmington, Del.	8¼	4⅛	2¼	
Trenton, N. J.	8¼	4¼	2¼	
Washington, D. C.,	8¼	4⅛	2⅛	
	8¼	4¼	2¼	
Louisville, Ky.	8¼	4¼	2¼	
Philadelphia	8½	4¼	2¼	
	8⅜	4 3-16	2 3-16	
Pittsburgh	8½	4¼	2¼	No standard.
Baltimore	8½	4¼	2¼	
	8⅝	4 3-16	2 5-16	No standard.
Cincinnati	8½	4½	2½	Average. Some make larger size.
Memphis	8½	4¼	2¼	

[Our correspondent is probably not aware of what has been done in this direction. The question of establishing a uniform size has been considered and pretty fully discussed by the National Brick Manufacturers' Association and the following size recommended: 8¼-in. long, 4-in. wide, 2¼-in. thick which was referred to the consideration of the National Association of Builders, and we have been informed that the latter Association also recommended the adoption of the above size for common brick. Both Associations have further recommended that face brick be made ⅛ inch thicker. The adoption of the above size depends now on architects, builders and brick manufacturers. If the architects will make their estimates and so far as they can, specify this size, and the builders and contractors require, so far as they can, the delivery and use of these sizes, and brick manufacturers make them except where the demand for the other sizes are imperative, the use of uniform sizes will speedily be brought about.

The manufacturers of molds will be confronted, however, with the difficulty of having the shrinkage of the clay to provide for. The difference in the shrinkage of clays will require different sized molds to secure a uniform size of brick when burned. Brick manufacturers before ordering their molds must determine by practical tests the shrinkage of their clay and order the requisite size to secure the size of brick desired when burned. We do not see how the use of standard sizes can be brought about otherwise. ED.]

Information Wanted.

Editor Clay-Worker:

There has lately been developed here, 100 feet below the surface, a 4-foot vein of red shale or bolus, suitable for the manufacture of mineral paint. We have pulverized it and find that it mixes well with oil and makes a fine body of paint. It has also been tried in a pressed brick machine and makes a beautiful red brown brick; very heavy, perfect in shape and rings like steel.

Under this red clay is three feet of white, or rather a light pea green, which looks like kaolin and is a plastic or molders clay. Either one of these clays after being moulded as soft as putty will harden in three hours without the aid of any artificial means, as hard soap stone.

Now what we want to know is this: Will this clay work well by the Dry Process? We should also like to hear from your correspondents as to the best machine and manner of pulverizing the clay for red paint and the best machine and manner of working it for brick. We should also like to know the nature of the white clay, how to work it and what it is most valuable for. L. E. MONSER.

Supt. Wenona Coal Co., Wenona, Ill

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Correspondence on all subjects of interest to Clay Workers is solicited. Communications from practical men will always be welcome. Address all communications to

T. A. RANDALL & CO.,
14 & 16 S. Tenn. St., Indianapolis, Ind.

IT IS HARD TO GET THE RIGHT MAN.

Turn, turn, my wheel! Turn round and round,
Without a pause, without a sound;
So spins the flying world away;
This clay, well mixed with marl and sand,
Follows the motion of my hand;
For some must follow, and some command
Though all are made of clay!
—Longfellow.

How to get the right man to command is a difficult problem. The inquiry comes again and again, "do you know of a good man to take the superintendency of our works?" Such men are wanted and wanted bad, all over the country. They are invaluable—treasures not picked up every day. Competency to superintend, manage men successfully and do it without any trouble, do it smoothly, without any friction; manage them to the best advantage, getting each to do his part and do it at the right time and in the right way. There are such men, but they pretty generally have places; are not out tramping for a job.

There are those that are, in a manner, born to command others and do it well; that can get men to follow the motions of the hand as clay does to the hand of the potter. Incompetency to command is a curse to any works. The sooner such are discharged the better it is for the success of the business. It is quite frequently the case that the proprietor can, or could, select a quiet, faithful workman, one who is familiar with the work in its details, and put him at the head, on trial, and in this way secure just the man so much needed.

A friend in relating his experience along this line, said: "My superintendent was fussy, dictatorial and harsh. There was frequently wrangles among the men. Some were out of place and out of joint apparently; the work did not progress, there were many mishaps and annoyances until I could stand it no longer. I said so in plain words to my superintendent. He thought I could not do without his services, and in fact, I had been of that opinion myself, but in the heat of my passion I had made up my mind to have an end of such out of joint business, not expecting to get rid of my superintendent; but when he tauntingly said 'Maybe you had better try it yourself.' I said 'I will, or will get some one that will;' not knowing where to turn to make my words good. The superintendent went away expecting that I would follow him up, at least he said I would. But I determined that I would not if it stopped the works. After a few moments study as to what I should do in the emergency; I thought of one of the men who had been a day laborer about the works for two years, quiet, easy-going, but always ready to do when he understood what was wanted. It occurred to me that I would get him to overlook the work until I could get another superintendent, and went at once and called to him to come into the office. He came in. I said, 'Joe, you know how everything is done about the works, don't you?' 'Yes, sir, I suppose I do.' 'Well,' said I, 'can't you oversee the men until I can get another man?' He was surprised until I explained matters, then he said, 'I will try if you say so.' Well, I said so, and told him to do what he could, distribute the men to such points as he thought best until we could do better. I called in the men at the close of the days work and told them that for a time Joe would superintend them, and they must understand that his word was law. In two or three days there was a change about the works and that, too, for the better. I could see it—I looked on. I soon saw that he was the man I wanted. I would not need to advertise for one in the Clay-Worker, and I didn't. And I tell you for a fact, I would not change him for any one in my knowledge. It is simply in him to get the most with the least friction I ever saw."

So it is, there are men about us quite often that if raised to the dignity of the position of superintendent develop a competency for the place we never dreamed of. They prove to be orderly, even tempered, judicious, careful and so manly in commanding the services of those under them that they remind us of the clay in the hand of the potter at the wheel, "it follows the motion of the hand."

"For some must follow, and some command,
Though all are made of clay."

THE COPYRIGHTING.

A contemporary indulges in a deal of word painting, condemnatory of the copyrighting of the proceedings of the National Brick Manufacturers' Association—says "it's not American," etc. It is awfully horrible not to be "American." The Executive Committee ought to have consulted the oracles before doing this thing. What of it, anyway? Well, yes; it prevents publishers from using the proceedings or any part thereof without giving the necessary credit. The giving of the proper credit brings the Association and what it has done into more general recognition. That is all there is of it. Our contemporary is at liberty to string out the proceeding in its own columns throughout the next quarter of a century, if it wishes to, provided the proper credit is given.

The copyrighting is very much like the "chip in the soap" symbol—the soap is just as good with the chip and just as good without the chip.

The proceedings are just as good with or without the copyrighting. It will be eminently American to use them *with proper credit.*

WHY THINGS SHOULD BE KEPT IN ORDER TO SELL OR NOT.

The extent of the manufacture of brick and drain tile, the number engaged in the business, necessarily embraces very many who wish to sell or change locations. Men grow old and feel the need of retiring from business activity. Others find themselves burdened with more business than they can well attend to. Again, others find themselves financially embarrassed on account of unexpected losses or reverses from outside business. And very many have families growing up around them that they would like to see settled favorably in life, which, as they think, makes it desirable to select a location where they may lay a broader foundation.

From these, and other causes, there are many who wish to sell the whole or a part of their interest in the business. But how to sell to advantage is the perplexing question? On this line we make the following suggestions: The first thing in order is to put the works in order.

How much this simple suggestion has to do with selling to a good advantage can scarcely be overestimated. A little effort in this direction will be repaid many times over People will judge of the prosperity of a business in most part by outside appearances. No amount of talk will overcome it, altogether. A tile or brickyard in a tumbled down condition leads a would-be purchaser to distrust the expediency of a purchase. Tile and bats, boards and poles, remnants of one thing and another scattered here and there, and a general want of order will discourage the best of purchasers.

Flattering advertisements or other favorable words of representation are powerless when parties come to look at the works. A few days spent in the general righting up of things will often work such a change that some party near by may be induced to invest money in the purchase of the whole, or part of an interest in the business.

In almost every community there are those who are quite ready to take hold of laudable enterprises if they can be led to believe that it will pay. Besides parties from a distance will make the appearance of the works largely the basis of their judgment. The works will talk for themselves; it makes but little difference how much is said or how well said more than this, if the general appearance of things are unfavorable.

Before offering to sell put your works in order by clearing up the rubbish, repair where neat and inexpensive repairing will add to the general appearance of things. Cart the bats out of sight, make the entrance to the grounds attractive. If there is a stock on hand put it in neat order and convenient of access. Rub up and oil the machinery. There are a hundred little touches that will add to the general business-like appearance.

When all this is done and a general business activity is taken on, some one not far away may be attracted by the orderly appearance of things and become a purchaser; or, if the works are advertised for sale, parties coming from a distance will be disposed to consider the possibility of a purchase. It will cool the expectations of anyone who may come from a distance in response to a flaming advertisement or favorable representations through personal correspondence if they find things in disorder. Besides, every good citizen ought to have enough personal pride to make him keep his works in order for his own credit and the credit of the neighborhood. It will lead to prosperity in business. Men like to go where there is order in business. They like to trade where everything in sight is in place and of some utility in its place. Do not say it is of little use to expend time and labor on these little things. To the contrary, it is important. Order has an educating influence; it leads to better business methods; it promotes better business growth; it is helpful to others, and if it is desirable to make a sale of a business it paves the way to it. In short, it is a good investment of money and labor to make and keep things in order.

MISREPRESENTATION.

In the report of the proceedings of the Iowa Tile, Brick & Drainage Association, made by the Brick, Tile and Pottery Gazette, Mr. Billingsley, the senior editor of the Clay-Worker, is reported as saying:

> "But little of the so-called fire-brick are more than common clay. Some are hard, others are soft, and all will melt at even a moderate temperature. True fire-brick are very scarce in this country, and are so soft that even the flames of a furnace will wear them away. Until the recent discovery of genuine fire-clay in California, English fire-brick were the only ones known in modern times, at least, and the rest of the so-called fire-brick of this country are but weak imitations of the true article."

WHAT "MR. BILLINGSLEY" DID SAY.

The subject of street paving was under discussion, some of the speakers in the course of their remarks referred to the use of a good article of fire-clay brick for pavers, we said, substantially that the best fire-clay brick were not suited for pavers—that they were too soft—that there were many grades of fire brick, some of which were made in part of potter's clay. That in California they claimed a superiority for their fire-brick over English fire-brick (which they had formerly used for smelting furnaces)—that they would stand an intense degree of heat and not wear so badly by the flame—that a good quality of common clay with a mixture of part fire-clay and then burned to almost a flinty hardness would make good pavers, that the fire-clay would serve to preserve the form under the necessary degree of heat—that there were excellent clays in Iowa, both fire and common clay, for the manufacture of paving bricks—that we had seen some very fine grades of fire brick made from Iowa clay, and referred to some brick that we had seen made at Indianolia, Iowa.

It never entered into our brain to say, that "until the discovery of genuine fire-clay in California, English fire-brick were the only ones known in modern times," etc. We have visited too many fire-brick establishment in all parts of the country East and West, North and South, and have acquainted ourselves with the clay industries of the country too fully to make any such a wild statement. But we will say now and here, in cold type, that there are cheap grades of fire-brick that are little superior to the best grades of common clay.

Again in the same report we are credited with having read the "paper read for him before the National Brick Manufacturers' Association." The truth is, that the Convention on the first day of the meeting requested us to read a paper on brick paving, with the provision that if we did not have the time to prepare a paper we might read the one referred to. But we prepared a paper that evening suited to the locality—quite a different paper, both of which have been published in the Clay-Worker, and our readers can judge for themselves as to the truth of our statement.

Our sanctum was honored recently by the presence of Mr. Daniel E. Ryan, of New York, who, our readers will remember, has favored us with some very interesting communications describing some of the brick yards he has visited in the past few months. Mr. Ryan has been traveling through the Central and Western States on a tour of inspection with a view of informing himself as to the best and most improved methods of brickmaking and the most desirable and successful machinery. He feels well paid for the time and trouble expended and being a close observer has acquired much practical and valuable information which we trust he will, in part, at least, impart to our readers in future communications. Mr. Ryan is especially pleased with the kindly reception tendered him generally by the craft. At nearly every yard visited a hearty welcome has been extended and every facility offered for a thorough examination of the methods and machinery in use. This, we believe, is the experience of every one who present themselves in a proper and business like manner. This spirit of fellowship and co-operation is growing broader and deeper and is among the most favorable signs of the craft's progress.

EDITORIAL NOTES and CLIPPINGS.

Sac City, Iowa, is to have a brick and tile factory.

Africa & Co. have started a brick yard at Jellico, Tenn.

A. J. Hill is fitting up a brick yard at Whittingham, Vt.

Lay & Co. have started a brick yard near Winona, Miss.

W. J. Walker will start a brick yard at Marshallville, Ga.

Bond & Halsey have started a brick yard at Auburn, Cal.

The Mackay Brick Co., of Austin, Tex., has been incorporated.

C. L. Dill will start brick and tile works at Dillburgh, Ala.

M. Fite contemplates starting a brick yard at Cattaraugus, N. Y.

Jno. Burnett has started brick and tile works at Lake Charles, La.

C. L. Alexander & Co. have started a brick yard at Brimfield, Mass.

Egge & Huber, of Allentown, Pa., had a $500 fire at their brick yard recently.

A. E. Townsend & A. J. Cline have started brick works near Hickory, N. C.

W. H. Stewart, of Rock Hill, S. C., will start a brick and tile factory at Yorkville.

The Kearney (Neb-) Brick Co., are arranging to use crude oil for burning, etc.

F. W. Farquar, of Ensley, Ala., contemplate the erection of a machine brick plant.

The Troy (N. H.) Brick Co. will put in another machine thus doubling their capacity.

It is reported that an extensive bed of valuable fire clay has been found at Lancaster, O.

The Mackay Brick & Tile Co., San Antonio, Texas, has been incorporated. Capital stock $75,000.

Chas. Philips, of Columbus, Ga., contemplates going into the fire brick and terra cotta business there.

McGowan & Hollingsworth are starting a brick yard at Arrow City, Md., and may also make drain tile.

W. J. Kerr and others, of Pueblo, Colo., have purchased an interest in the Fire Clay mines at Canon City and will start a factory for the manufacture of fire brick.

The Lexington (Ky.) Brick Co. are burning with crude oil and are much pleased with this new fuel.

A. L. Hawks, of Saccarappa, Me., has put up a Chicago Iron Clad Brick Dryer, with which he is well pleased.

The Kiesel Fire Brick Co., Kittey, Me., has been organized by E. T. Wilson, Farmington, N. H., and others.

A. C. Spain & Co., Darlington, S. C., are increasing the capacity of their yard by the addition of new machinery.

The South Florida Brick, Tile & Terra Cotta Co. will increase their capacity by putting in another brick machine.

Stephen B. Quigley, of the firm of S.B. & A. M. Quigley, brickmakers of Mobile, Ala., died April 18th, aged 71 years.

A. K. Barwise & Co., of Pueblo, Colo., have organized a company for the manufacture of brick by the dry press process.

John Lyth, the well-known sewer pipe, tile and terra cotta manufacturer of Buffalo, N. Y., died April 27th, aged 69 years.

The stoneware pottery of Thomas Bros., near Cuyahoga Falls, O., was burned the 8th inst. Loss $6,000. Insurance $4,000.

A very extensive deposit of brick clay is said to have been discovered recently near Welshton, Fla., and works are to be erected there.

A subscriber at Saco, Me., writes that the brick interests in that section are prosperous and a largely increased demand is expected.

Camp & Thompson, of Akron, O. have purchased a complete outfit for a soft mud brick yard from Messrs. C. & A. Potts & Co., Indianapolis.

Harmon Brown and Geo. E. Waldorf, brickmakers, of Palatka, Fla., have dissolved partnership. The former will continue to run the yard.

Jno. W. Mason, R. W. Kennedy, Chas. Teeters, J. C. and W. J. Painter, have organized a company to manufacture fire brick at Thornton, Taylor Co., W. Va.

After "staying out" three weeks the striking brickmakers, of Baltimore, Md., have accepted the reduction of 10 and 15 per cent., making wages the same as in 1885.

The Collins Brick Co., Atlanta, Ga., has ordered machinery for plant with daily capacity of 160,000 common brick and will probably make pressed and fancy brick also.

Terpening Bros. & Brunk is the firm name of the company who recently started a brick and tile factory at Prairie Grove, Ark., with a capacity of 10,000 brick and tile a day.

The Middlesborough (Ky.) Brick and Tile Co. has been organized with capital $25,000. W. H. Kinnaird, Pres., J. E. Stormer, Sec'y, and I. C. Thompson, Treas. A plant will be built at once.

J. D. Hoff, of San Diego, Cal., has been experimenting with a combination of clay and asbestos and claims that the results are very satisfactory producing a fire brick that is superior in fire resisting qualities.

The Ontario Terra Cotta, Brick and Sewer Pipe Co., Toronto, Canada, has been incorporated. They propose to make pressed brick and tile extensively near Milton, on the C. & P. R., where they have an immense deposit of fine clay.

Messrs. Pike & Castle, of Chenoa, Ill., have favored us with a neat 10 page circular giving information relative to the New Discovery brick and tile kiln. From the many flattering testimonial letters from brick and tile makers who are using the "New Discovery" it evidently continues to grow in popular favor.

The buildings of the new Chelsea White Ware Pottery, at New Cumberland, W.Va., have just been completed and the work of putting in the machinery is now in progress. The works are said to be the largest in the world. They expect to commence operations in about three months, giving employment to 300 men.

We are indebted to Mr. Alfred Crossley for a copy of his new illustrated catalogue of Brick Machinery, Etc. This little book is evidently an importation, as it bears the unmistakable features of a foreigner. Much of the machinery illustrated will be new to most of our readers, any of whom can secure a copy by addressing Mr. A. Crossley, Ironton, O.

The Eureka Brick Machine Mfg. Co., of St. Louis, Mo., write that they are having a busy season being unable to build machines fast enough to supply the demand promptly. They have therefore arranged to manufacture the new Improved Eureka on a larger scale and hope thus to keep up with their orders, and add: "We attribute a great deal of our success to the Clay-Worker.

J. Q. Adams & Sons write, that they have sold their plant at Fayettte, Mo., and have located at Birmingham, Mo., nine miles from Kansas City, where they are putting in a new plant, including one No. 3 Adrian Brick and Tile Machine, 40 h. p. engine, made by Chandler & Taylor, 60 h. p. boiler, steam dry house 60x80 feet, with racks and pallets. They will depend on Kansas City for a market, and will begin running about May 10th.

C. W. Raymond & Co., of Dayton, O., are constructing an entire new plant which they will occupy by July 1, 1889. They will also have almost a new line of wood and iron working machinery, together with special tools adapted to their work. Having built additions to their present shops every few months to keep pace with their growing trade and exhausted their limit of space, they will move to a new and larger location as indicated above.

There is a case before U. S. Judge Blodgett, Chicago, to determine the duty on glazed tiles designed for interior decoration only. The importers claim that they are dutiable only at 20 per cent. as paving tile, but the government authorities assessed them 55 per cent. as "glazed earthenware," and this decision was sustained by the Secretary of the Treasury on appeal. The difference on the duty among the various importers interested in this question is said to have amounted to nearly $10,000.

The King Hill Brick Co., of St. Joseph, Mo., will manufacture paving brick extensively this season as there is a large and increasing demand for this ware in their vicinity. They will also manufacture a large variety of ornamental brick, hollow building material and building brick, and are erecting a Penfield No. 10

D Machine and Horizontal Pug Mill in their works, and arranging their works for a steady run. Indications point to a large demand for brick for paving material this season and the western cities especially are beginning to appreciate the advantages of brick as pavers.

Mould making for dry clay brick presses has grown to be a specialty closely connected to the rapid strides the dry clay presses are making in public favor. The St. Louis Iron & Machine Works, of St. Louis, Mo., have gained such a reputation for superiority of moulds through their Lion press, that they found it necessary to operate a special department to fill the many orders for moulds wanted by presses of other makes besides their "Lion." A letter to them from the Calorific Brick Co., at Kansas City, speaks for itself: "We have made over *eleven million* brick in your last mould and are using it again this season."

Michigan Brick and Tile Machine Works, Morenci, Mich., say: "In the last two weeks we have shipped one No. 2 machine and Potts Disintegrater to B. Erickson, Bridgeton, N. J.; one No. 2 combined machine to John Freehouse, Sunfield, Mich.; one No. 1 and 2 to Reidale Bros., Chaska, Minn.; one No. 6 "Special" to Morrison & Son, Minneapolis, Minn.; two Little Giant Re-presses to Frey-Sheckler Co., Bucyrus, O.; one patent Side-Cut Brick Table (capacity 75 M per day) to R. M. Hasty, Minneapolis, Minn. We shall ship within the next two weeks one No. 6 "special" to South America, and one to Mexico.

The Lorillard Brick Works, of Keyport, N. J., have been making extensive changes in their plant preparatory to greatly increasing their capacity. The three Penfield No. 10 Machines which were used last season have been replaced by three of the large No. 20 Penfield Machines with complete outfits, including pug mills, and large four roll crushers. In addition to this, they are placing in their works four outfits for the manufacture of sand moulded brick, using the Penfield Upright Stock Brick Machines with direct attached pug mills. This will give them, undoubtedly, the largest capacity of any brick works in the United States.

Jonathan Creager's Sons, manufacturers of the Grand Automatic Brick Machine, note the following recent sales: Grand Junction (Tenn.) Fire Brick Co., complete plant; S. A. Douglas & Co., Covington, Tenn., complete plant; T. B. Townsend & Co., Zanesville, O., second machine; G. R. Franz, Freedom, Pa., one S. P. machine; Camp & Hinton Bros., Lumberton, Miss., one machine; E. Achee, Labadieville, La., one machine; Wm. Busse, Covington, Ky., complete plant; Fox Bros., Willamansett, Mass., one machine; Leach & Ash, Kokomo, Ind., complete plant; New Brick Works, Lancaster, N. Y., two S. P. machines and extra heavy pug mills; W. N. Walker, Kansas City, Mo., complete plant.

M. H. Jodd, one of our subscribers at Hot Springs, Ark., has a fine brick yard with daily capacity of 30,000. There is forty acres of good land and 15 acres of timber. The clay is excellent. one bank being a rare quality, burning snow white and making a fine hard brick. The yard is well equipped with machinery, kilns, etc., and a good dwelling and other buildings, There is a large and increasing demand for brick at $8 a thousand. For reasons not relating to business, Mr. Jodd desires to dispose of the plant and return to his old home in the North. The location seems to be a very desirable one for an experienced brickmaker and should receive the attention of those desiring to establish themselves in a warm climate.

To keep up with the demand of the age Messrs. C. W. Raymond & Co., of Dayton, O., have constructed a No. 4 Power Perfection Press. It is highly successful as a worker of paving blocks, tiling, ornamentals, etc. Three of these presses are now under construction for one firm for pressing street paving blocks, solidifying, finishing and ornamenting the blocks, doubles their market value. A No. 5 Power Press, weight nearly 4,000 lbs., is also under way, which will be completed about April 1st. It will work a die large enough to press an entire piece of panel work in terra cotta, or the very largest tiling made. This press was built for a New Orleans paving syndicate, but large orders from other sources are indicated.

The Fort Payne Coal & Iron Co., Fort Payne, Ala., with a mineral property of 32,000 acres and a subscribed capital of five millions in addition to their other extensive operations in connection with their coal and iron industries have decided to commence the erection of Fire Brick works at a cost of $40,000; to this will be added a first-class Sewer Pipe works, plans for which are now being prepared. Other branches of fire clay manufactures will be taken up as quicky as circumstances will permit. It is the intention of the Company to make Fort Payne the fire clay metropolis of the South. Mr. W. Garland Taylor, at the present time Superintendent of the Mt. Savage Fire Brick Works has been appointed to the management.

Mr. E. G. Durant, of Racine, Wis., has invented a building block which has special merit and while he does not expect to revolutionize the building industry, he claims for his blocks adaptability for certain localities. The block is formed by joining by a metal binder two bricks, having concave sides, which form between them a hollow arch which admits of a free circulation of air. The outer wall of the block which forms the front of the building is ornamented in any design, while to the inner surface the plaster is applied direct. The Southern California Water & Sewer Pipe Mfg. Co., of South Riverside, Cal., will manufacture them. They will be made upon the Perfection Brick Press, the company having placed an order with Messrs. C. W. Raymond & Co. for their No. 3.

Messrs. J. W. Penfield & Son of Willoughby, Ohio, report a very flattering trade and are rushed to their utmost capacity to fill orders. They report a large sale for their Upright Stock Brick Machine and although this machine has been on the market for a few weeks, they have already shipped a large number of these machines. The Lorillard Brick Works, Keyport, N. J., are erecting four of these machines and machines

The Link Belt Machinery Co.,

New York, Minneapolis. CHICAGO, ILL., 11 to 23 South Jefferson St. **BURR & DODGE, Philadelphia.**

MAKE

ENDLESS TROUGH CONVEYORS,

Adapted to handling (on incline) clay direct from clay-bank, or pit.

METALLIC APRON CONVEYORS,

(Sometimes called clay elevators). Adapted to feed Brick or Tile Machine.

TILE ELEVATORS, (New Pattern),

Will elevate any size up to 18-inch. Send for Prices.

LINK BELT ELEVATORS (using buckets),

Will elevate Semi-Dry or Pulverized clay.

We are prepared to contract for the entire machinery required for a Complete Brick or Tile Works of any capacity.

Send for 1888 Catalogue.

(Mention the Clay-Worker.)

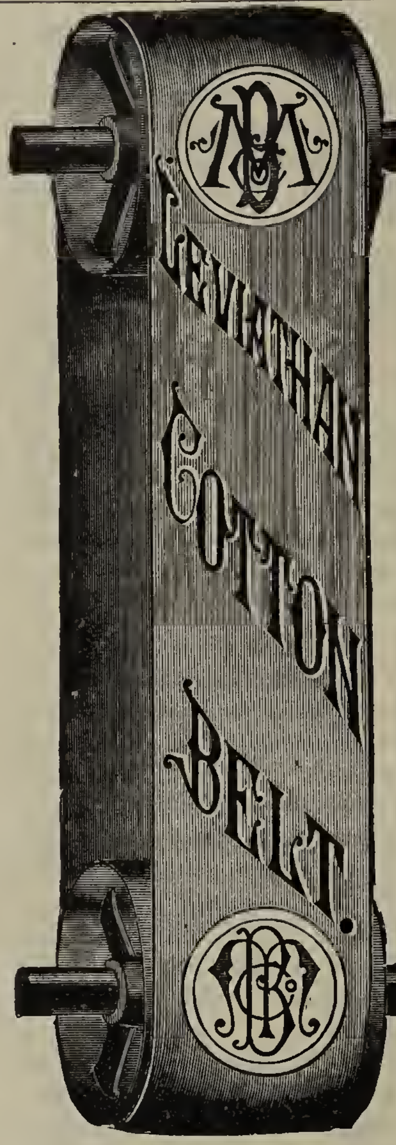
have also been shipped to Philadelphia, Pa., Baltimore, Md., Reading, Pa., Madison, Wis., Royersford, Pa., Worcester, Mass., Northeast, Pa. and other points. The trade on stiff clay machinery, crushers, pug mills, etc., is also very fine. In fact, the firm report that they are too busy to give a detailed list of their sales and shipments. Every indication points to a prosperous season.

A fatal riot occurred on the 5th of May at the village of Washington, N. J. between the brick yard employes of Edward Furman and a gang of Italians employed by the Raritan River R. R. Co. The latter undertook to construct a branch of the road through land owned by Mr. Furman, who opposed the project, as it would deprecate some valuable clay property of his. The agent of the Railroad Co. thought to steal a march on Mr. Furman and so set a gang of 100 men at work laying track Saturday night at 12 o'clock. Mr. Furman was absent at the time but his foreman, Joseph Cathcart, being apprised of the scheme gathered his men and attacked the Italians with clubs and stones driving them from their work. A fearful fight followed continuing from time to time till morning resulting in the death of one of the men from the brick yard and serious injury to many others on both sides. The county sheriff was finally called on to stop the riot.

NEW INVENTIONS.

The following is a list of patents appertaining to brick, tile, terra cotta, sewer pipe, pottery, etc., and the machinery used in their manufacture issued since our last number: (A copy of any of them can be obtained by sending 25 cents, the official price, to Chas. E. Brock, Patent Attorney, 925 F St., Washington, D. C.)

400,097. Incrusting Bricks—J. C. Anderson, Highland Park, Ill.
400,996. Frame for Building Blocks—B. W. Belden, St. Louis, Mo.
400,997. Paving Block—R. B. Berril, Lexington, Mo.
401,030. Paving Brick—D. Harger, Des-Moines, Iowa.
401,172. Furnace for Brick Kiln—C. Keep, Erie, Pa.
400,974. Brick—T. Thorn, St. Clair, Pa.
400,767. Street Pavement — H. Hallwood, Columbus, Ohio.
400,575. Brick Kiln—D. Laemmle, Ft. Wayne, Ind.
400,477. Paving Tile — C. O'Connor, Lock Haven, Pa.
401,492. Paving Block — G. Graham, Cleveland, Ohio.
401,396. Brick Truck—J. Weeks, Fort Worth, Texas.
401,836. Chimney—J. Hodel, Cumberland, Ind.
401,750. Brick Machine—S. Lasor, Philadelphia, Pa.
401,862. Machine for Pulverizing Clay—Jno. Shaffer, Philadeldhia, Pa.
402,821, Drying Attachment for Brick Kiln—R. J. Gurnee, Rondout, N. Y.
402,369. Brick Kiln—E. Von Oven, Napoleonville, Ill.



SOLE MANUFACTURERS.

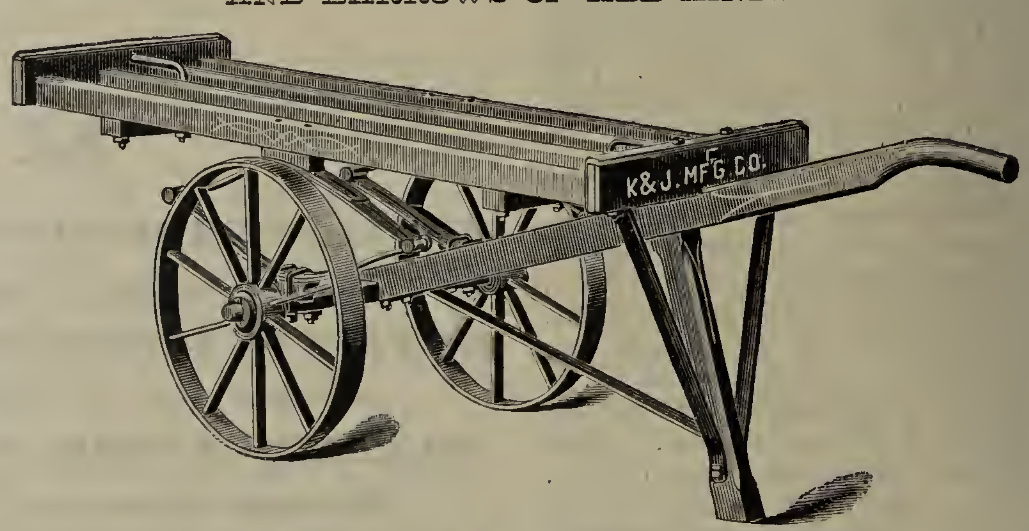
Main Belting Co.,
Manufacturers of the Celebrated
Leviathan Belting!
WHICH FOR
Strength and Traction Power
HAS NO EQUAL.
Specially adapted for Brick and Tile Machinery.
Unaffected by Heat, Steam or Dampness.

Send for Price List.
Samples sent on application.
Mention this paper.
FACTORY AT PHILADELPHIA.
Address,
Main Belting Co.,
248 Randolph Street, CHICAGO, ILLS.

NOTE—To any responsible party sending us measures, we will ship a "Leviathan" Belt on sixty days trial; to be paid for if satisfactory.

SEE THE BATTLE OF ATLANTA.
Market St. Between Ills. St. and State House, Indianapolis.

The Kilbourne & Jacobs Manufacturing Co.,
LARGEST MANUFACTURERS IN THE U. S., OF
Bolted Brick Barrows, Mule Trucks, Spring Brick Trucks,
Road Scrapers, Wheel Scrapers, Grading Plows;
AND BARROWS OF ALL KINDS.



Spring Brick Truck---Steel Spoke Wheels.

Designed especially for handling green pressed brick; also common brick in moulds, and adapted for tile, etc. Wheels bored and axles turned.

Platform, 17x60 inches; height from ground, 22 inches; axle, 29 inches long and 1⅛ inch square; length over all, 84 inches; wheels, 20 inches in diameter, 2-inch face. Weight 125 pounds. Price $25.00.

Send for general catalogue.

THE KILBOURNE & JACOBS MFG. CO. - - Columbus, Ohio.

Grant & Murray's Improved Brick Machine.

In placing this Improved Machine before the public and setting forth what we claim for the merit of the machine, we guarantee to fully verify in the practical operation of the machine.

This process of brickmaking has been thoroughly tested and has proven to be a perfect success, and is as cheap a process as any on the market. The machine is constructed wholly of iron and weighs upwards of twenty thousand (20,000) pounds. It is simple and durable. The operation of it is easily understood. Its capacity is two thousand (2,000) brick per hour. The brick are far superior in strength and finish to common brick. The clay is worked at a consistency that under pressure deposits the greatest amount of clay in the brick, giving them great strength and thereby making them especially adapted for street paving purposes. In actual tests where there has been the strongest competition there has not been a brick submitted that would stand near the pressure, absorb as little water, or stand the wear by friction as these brick.

If Brickmakers or those that are going into the business will send us a barrel of their clay we will fully demonstrate the quality of the brick in this respect.

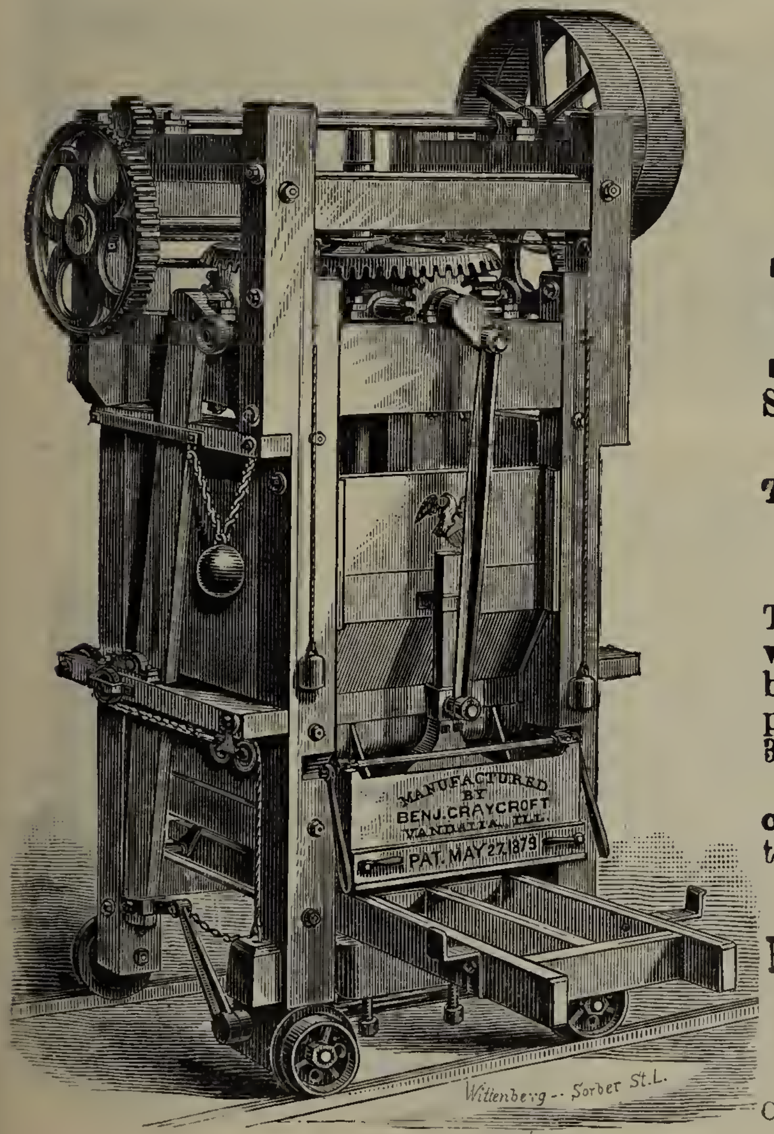
Not having sufficient capital we desire to dispose of an interest in the patent and business generally to some one, or company that would have sufficient capital to push the manufacture and sale of this machine as the merit of it would justify or demand.

We ask the attention of manufacturers desiring a specialty to the above, with a view to the manufacturing of the machines.

Machines can be furnished on short notice. Correspondence solicited. For further particulars, prices, etc., address

GRANT & MURRAY,
Middleport, Ohio.

Mention the Clay-Worker].


MANUFACTURED BY BENJ. CRAYCROFT VANDALIA, ILL.
PAT. MAY 27, 1879
Wittenberg - Sorber St. L.

EAGLE
BRICK
MACHINE
Steam and Horsepower.

THE BEST MACHINE IN THE MARKET.

The Horsepower Machine will make 17,000 to 20,000 brick per day; the Steam-power Machine, 25,000 to 30,000.

These Machines are sold on their merits, guaranteed to do first-class work.

Send for Circular.

BENJ. CRAYCROFT.
Manufacturer,
Vandalia, Ills.

C. J. CRAYCROFT, Fresno C'y Cal., Gen'l Agt. for Pacific coast.

THE IMPROVED CHAMPION BRICK MOLD SANDING MACHINE.

The attention of brickmakers is called to the new advertisement on the back page of the Clay-Worker of A. H. Newton & Bros., relating to their Improved Champion Brick Mold Sanding Machine. The manufacturers of this machine claim many material advantages, some of which are specified in the "ad." They were the first to place upon the market any practical mold sanding machine, and have supplied all demands from all sections of the country, and while their machines have met with the approval of brickmakers and with largely increased sales each successive season, and have been free from any serious fault of construction or operation, the manufacturers have kept an eye on the requirements of the trade and have met the same by constantly adding new features and improvements until they have produced a machine which is perfect in its operation. By an ingenious improvement of the feed they have avoided all possibility of the molds binding upon each other and at the same time have prevented the scraping and collecting of clay from one mold and depositing it on the adjacent mold, which has been the cause of "lumping" the molds. Practical brickmakers will appreciate this improvement and the fact that it tends in such a material degree to producing a clean, uniform and smooth brick. The manufacturers also come out with a fair, manly notice to the public at large that their machines are covered by several patents having broad claims. These cover not only the feed-table as originally constructed, but broadly, the rotating cylinder and a belt for keeping the molds in place while being sanded. Being the pioneers, and having judiciously secured patents for other improvements from time to time, it would seem that followers in the field and purchasers of machines subsequently patented should take the caution to indemnify themselves against prosecutions for infringement, as the user is just as liable as the manufacturer. In fact, in this day of patents and patented machines, it is quite customary for manufacturers to indemnify purchasers and users of their machines against damages accruing by reason of infringement.

For experienced workmen or desirable situations, cheap second-hand machinery, etc., etc., read the "For Sale, Wanted, Etc.," columns.

FOR SALE, WANTED, ETC.

☞Advertising rates in this column 20 cents a line, or 3 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion.☜

FOR SALE CHEAP. 50,000 A 1 fire brick.
5 1 d. A. BROWN, JR., Portland, Ind.

CLAY GIVEN AWAY. Immense beds suitable for paving brick, pressed brick and fire brick.
Address JAY BAKER & CO.,
Streator, Ills.
3 4 c.

FOR SALE. Stedman Pulverizer; new improved. 40-inch, with fly-wheel; in perfect order.
CARTERET BRICK WORKS,
Carteret, N. J.
5 3 d.

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c

FOR SALE. One Frey, Sheckler & Hoover four roll clay crusher, a good and strong machine. Will sell cheap. Address ANTHONY FRIES,
Brookville, Ind.
4 3 d.

WANTED. A Potts geared tile machine or a No. 7 Penfield mill. Address, giving price,
J. E. DONALDSON & CO.,
Montezuma. Ind.
5 1 c.

FOR SALE. Clay land on track; unlimited cash demand for brick in Duluth, St. Paul and Minneapolis. Address F. McNAMARA,
Little Falls, Minn.
5 6 c.

WANTED. A foreman who understands the dry clay process. Also a few men to operate Phil. hand presses. D. J. CURTIS,
Springfield, Mass.
5 1 p.

WANTED. All brickmakers of experience desiring situations to send their address with particulars as to experience, reference, etc., to
5 1 c Box P, care Clay-Worker, Indianapolis, Ind.

FOR SALE. One Simpson Brick Press used only three months. Two Boyd and one Chase Pulverizers, cheap. STANDARD MENOMONIE BRICK CO.,
4 2 c. 309 Hennepin Ave., Minneapolis, Minn.

FOR SALE. Having changed h. p. to steampower, I offer for sale very cheap a h. p. Quaker Brick Machine and one good brick press. A. STOLZ,
Meadville, Pa.
4 3 d.

WANTED. A first-class red brick burner one with experience in the successful burning of brick with crude oil. Address with full particulars,
SPA SPRING BRICK CO.,
Woodbridge, New Jersey.
3 tf d.

WANTED. A position as foreman in sewer pipe or architectural terrs cotta works, by a practical and reliable man, industrious and sober and fully competent to manage either of the above works.
Address SALI-SILICATE,
Care of Clay-Worker.
4 tf.

FOR SALE. One Whittaker Semi-dry Brick Machine; one Stedman Pulverizer; one Bucket Elevator; all in good order, having made only about 600,000 brick. J. M. HARRY & CO.,
Dallas, Texas.
2 6 5p.

FOR SALE. One Grand Automatic Pug Mill complete with two 36-in. pulleys, used only four months, almost new. For sale cheap. Address at once WESSELS & NIEMANN,
4 4 c. Jefferson Ave. and Cherokee Sts, St. Louis, Mo.

FOR SALE. Three No. 10 Penfield Brick Machines, Crushers and Pug Mills, also ten thousand iron pallets; been used one season. Will sell half price of new ones. Apply to LORILLARD BRICK WORKS,
Keyport, N. J.
4 2 d.

C

FOR SALE. One Kennedy Dry Clay Brick Machine in good order, cheap. One Martin Brick Machine, Pug Mill, Engine, Boiler and everything complete for running. Address
D. P. SHENFELDER & CO.,
Reading, Pa.
5 2 c.

FOR SALE. Full outfit dry press brick machinery, 75 h. p. engine, boilers, shafting. etc.; 2 Stedman Pulverizers, 2 heavy Andrus Presses, 1 new Simpson 4-Brick Press, elevators, cars, trucks, etc. For price and particulars address J. A. BOMMAN,
4 2 d. Kenyon Block, Minneapolis, Minn.

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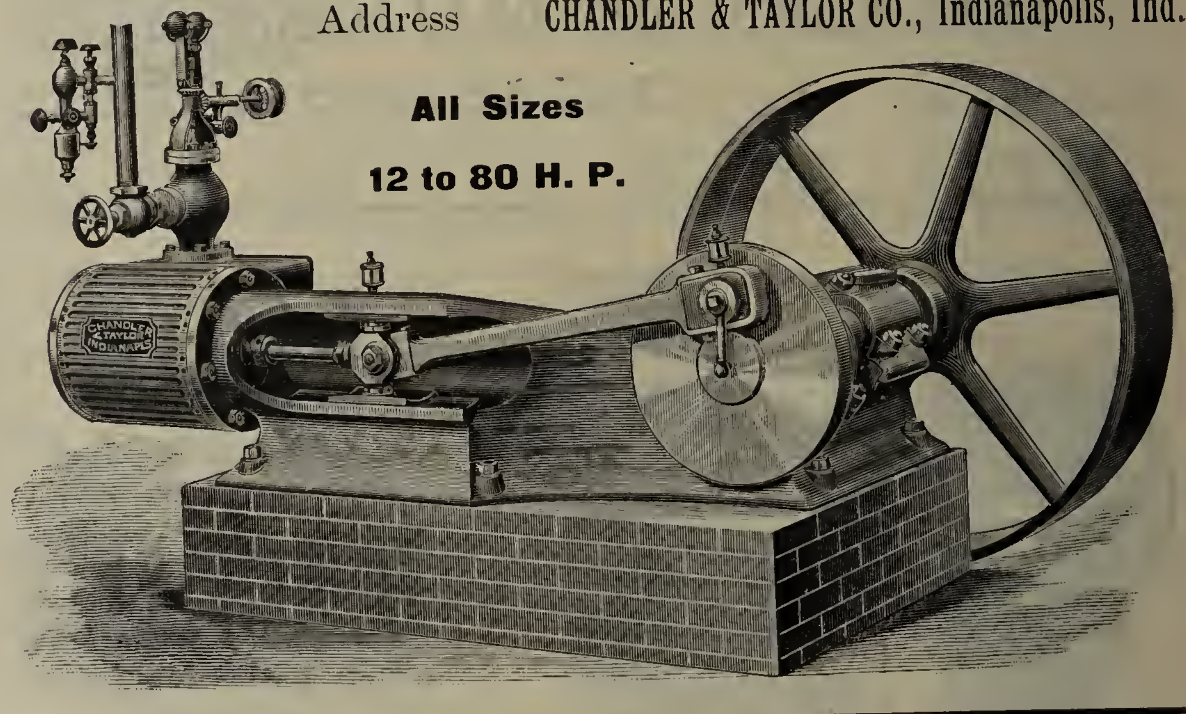

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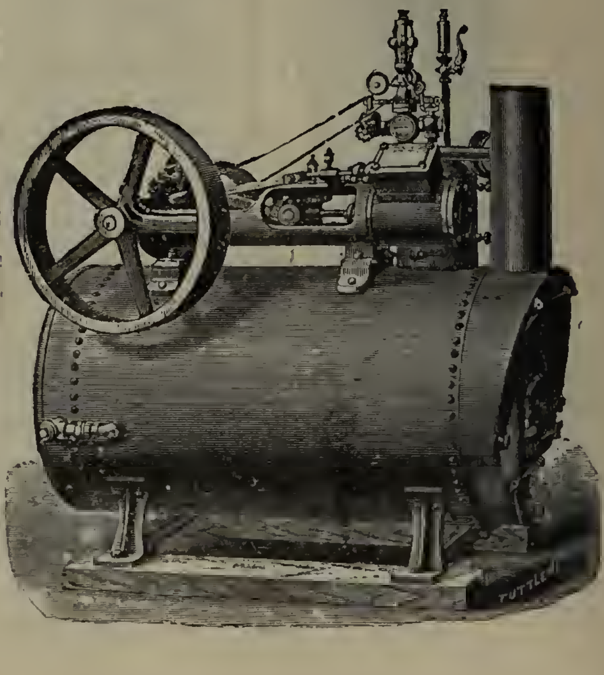

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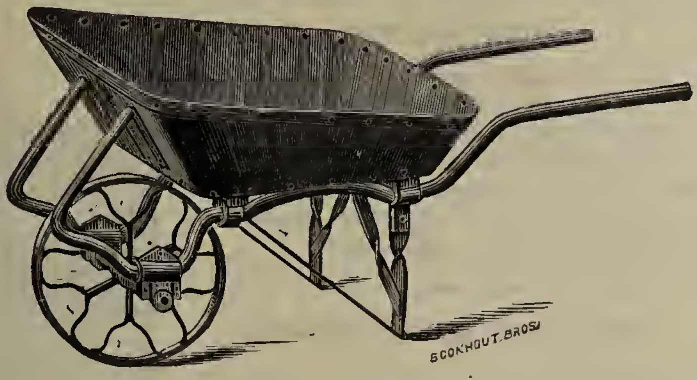

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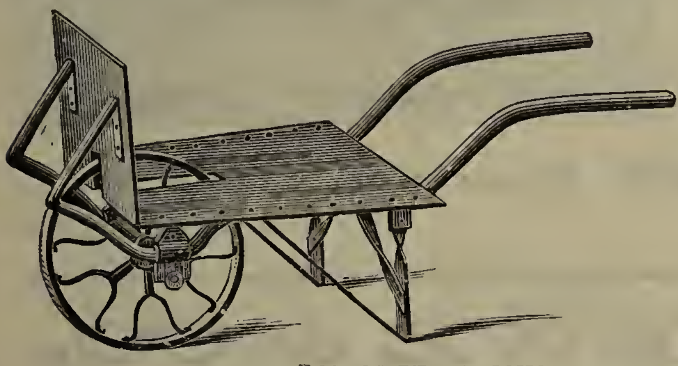

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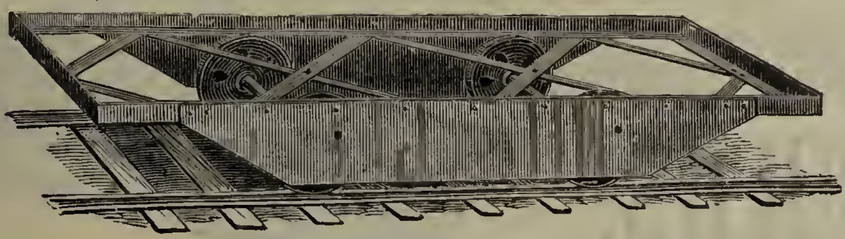

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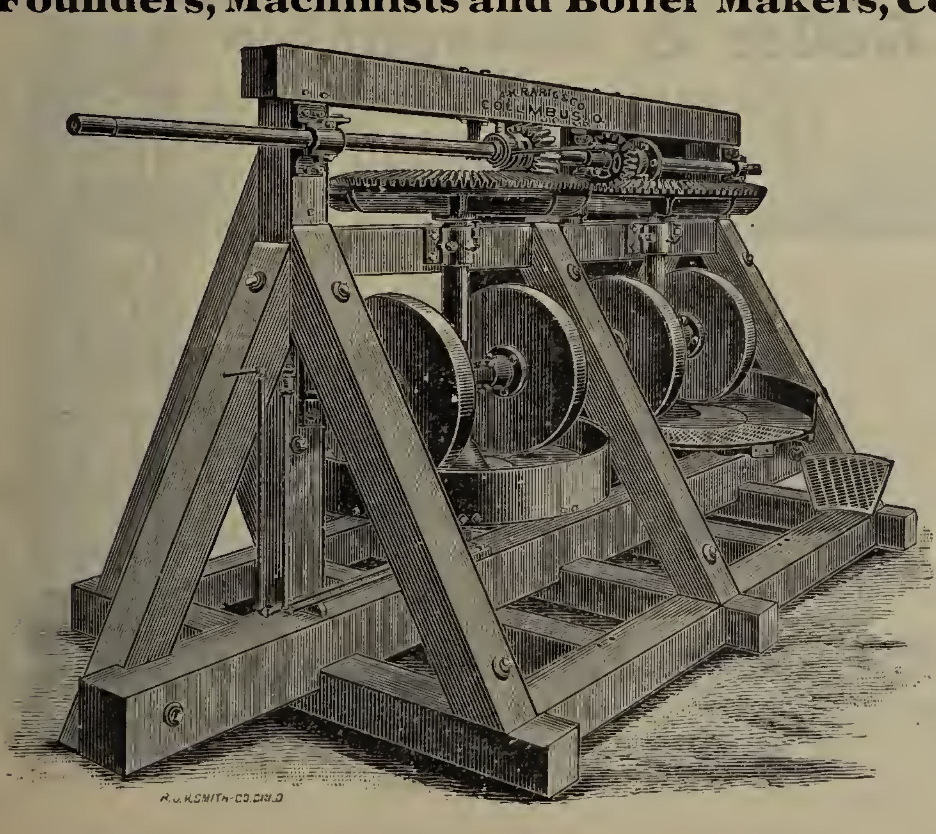
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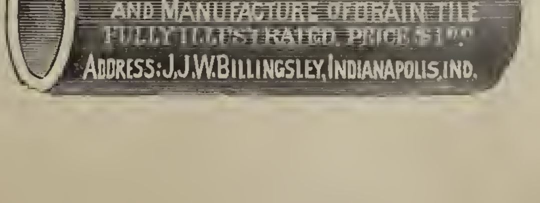
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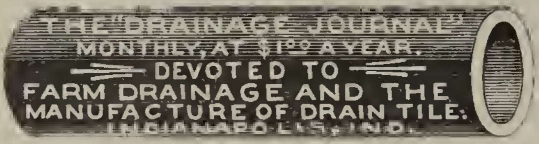
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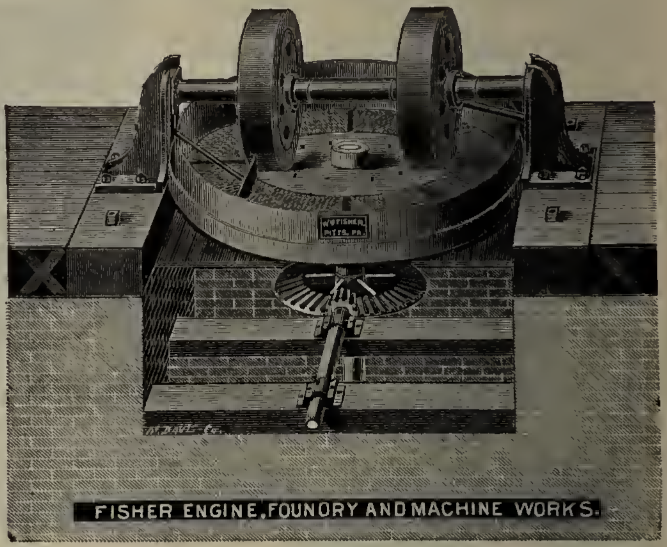

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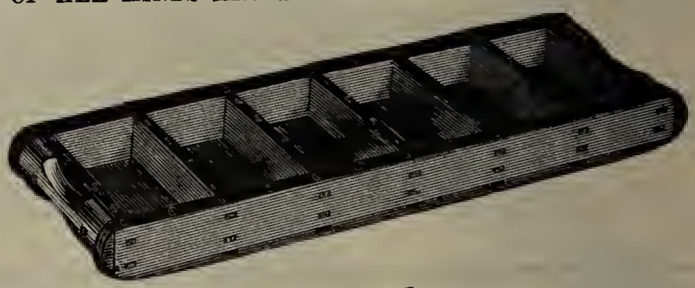

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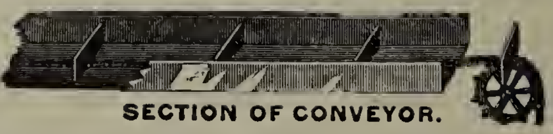
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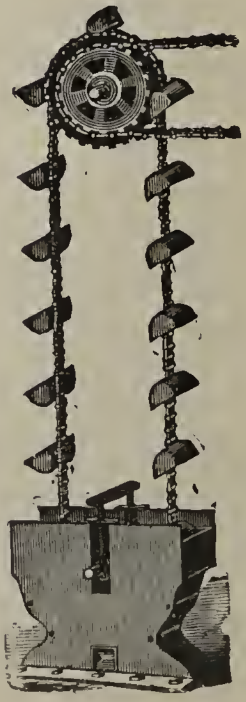

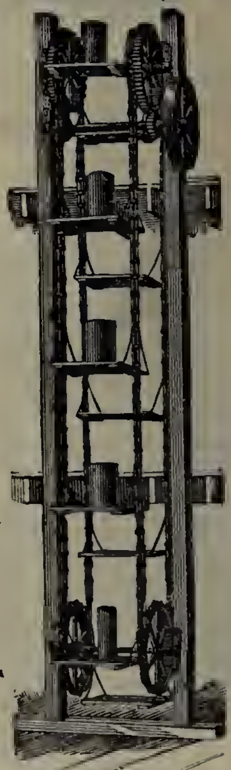

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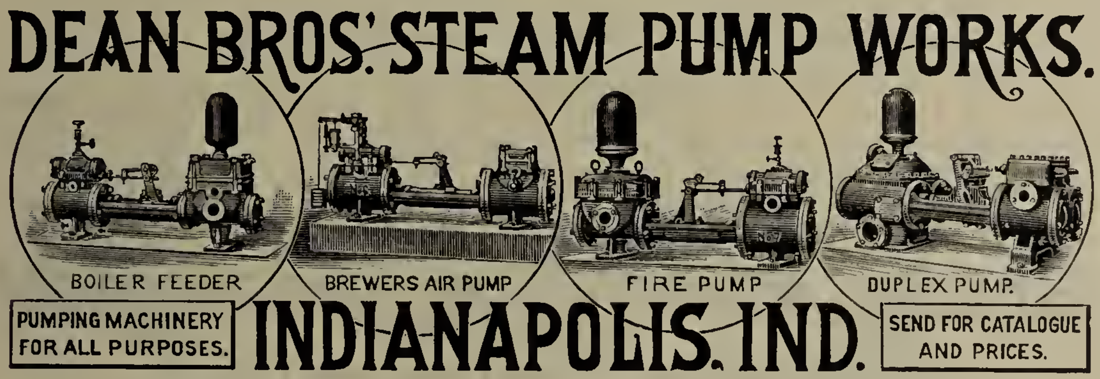

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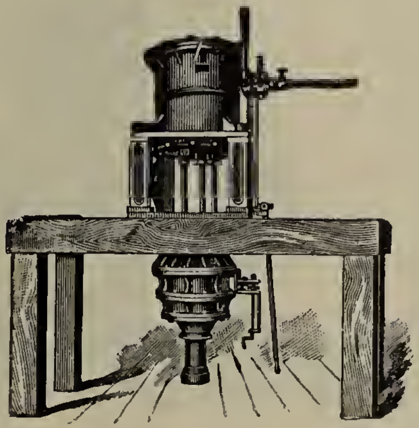

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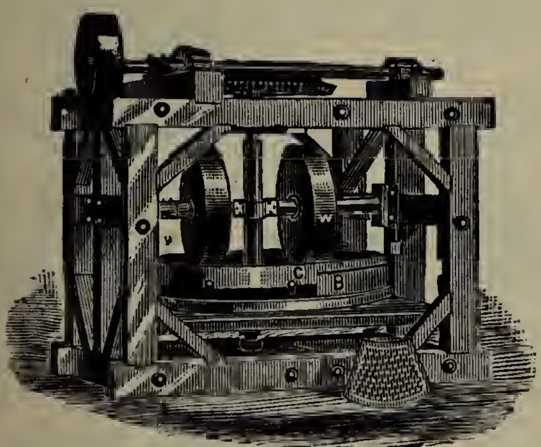

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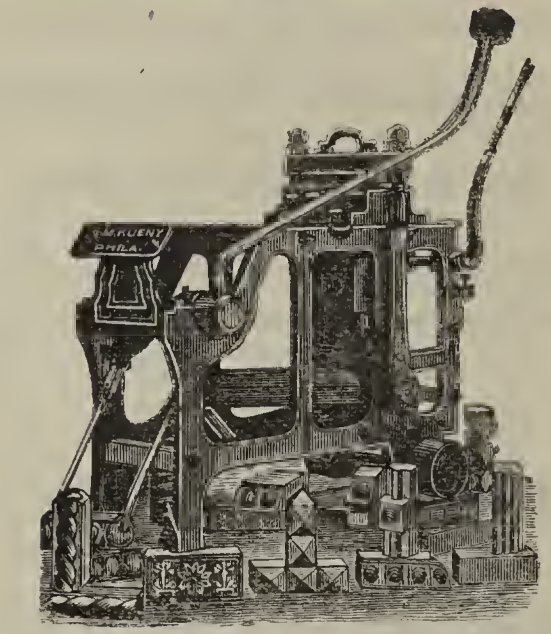

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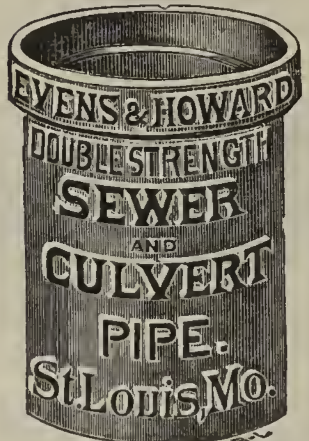

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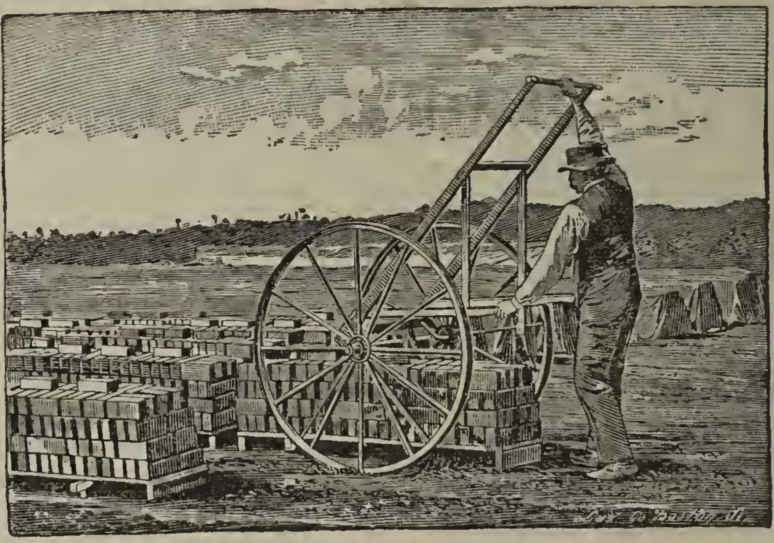

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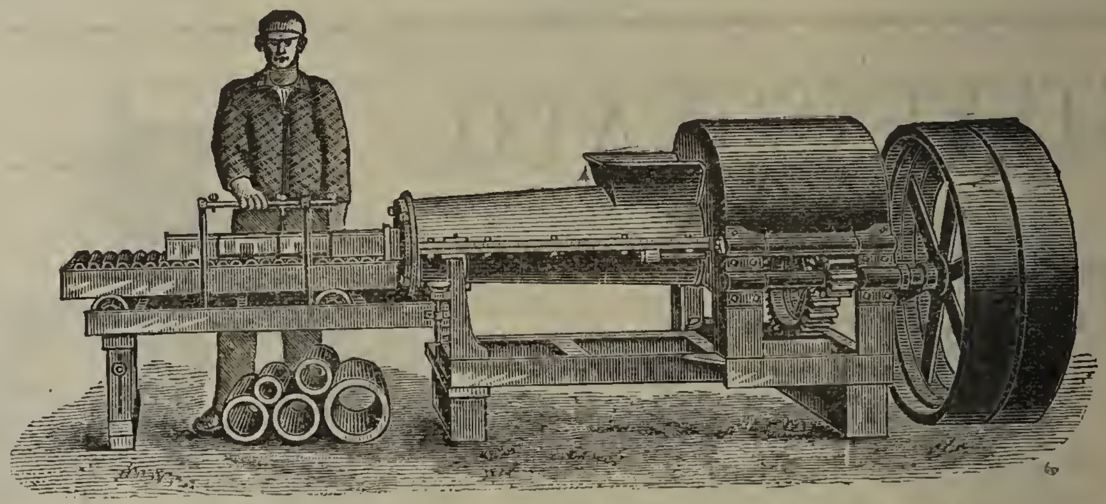

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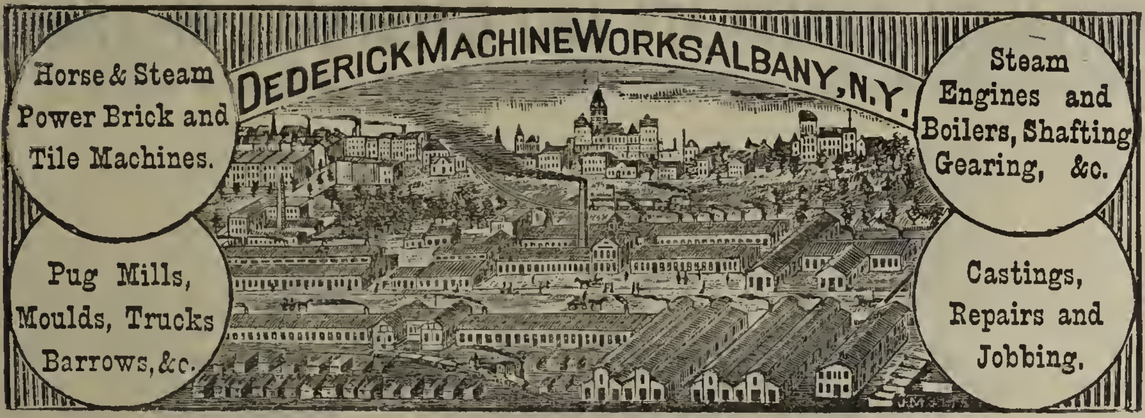
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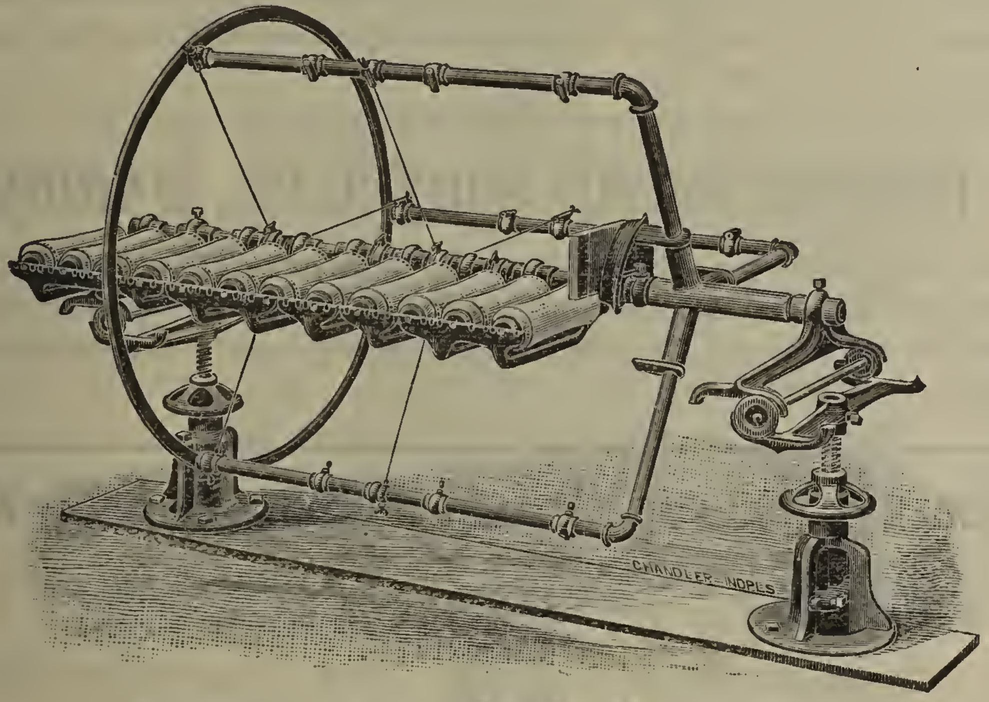

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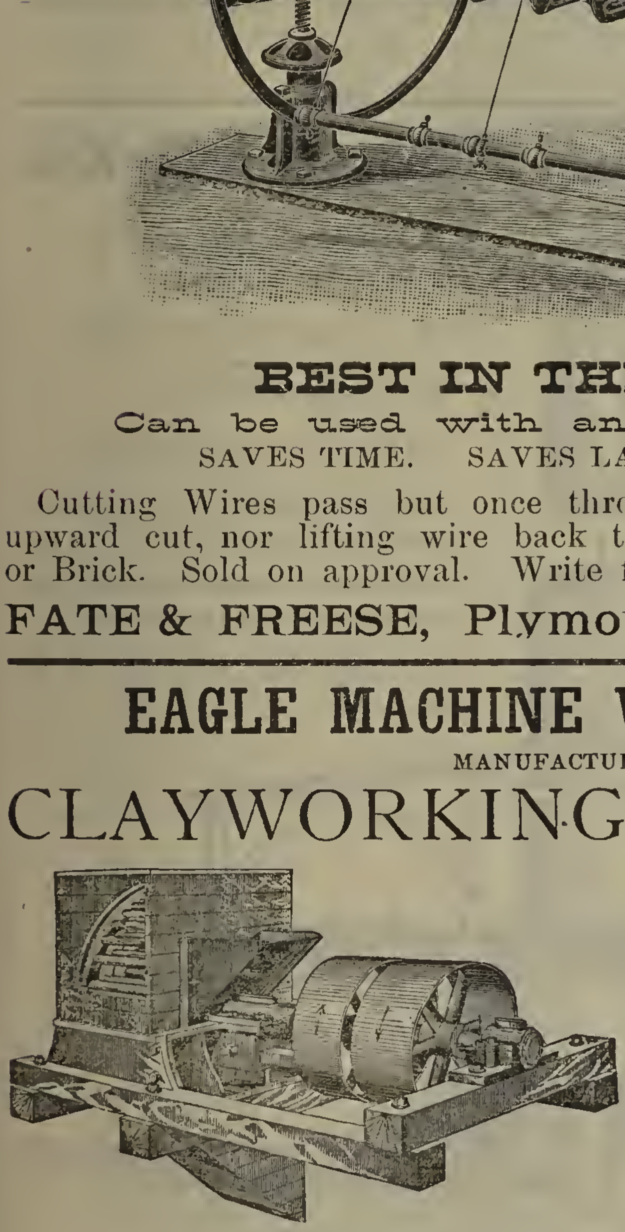

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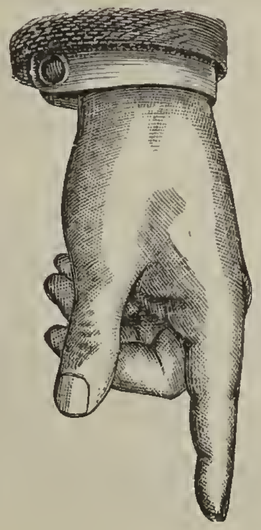

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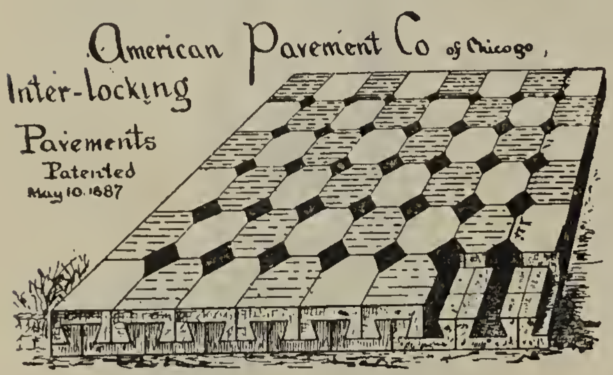

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Assaying and analyzing in all branches. Working results given. All communications confidential. References: Christy Fire Clay Co., St. Louis; Pacific White Sand Co., St. Louis; Kansas City Sewer Pipe Co.; DePauw Plate Glass Co.; Thos. Coffin Co. and hundreds of other annual customers all over the United States. Address as above.

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A perfect result from any refuse fuel.

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Construction of the kiln very cheap.

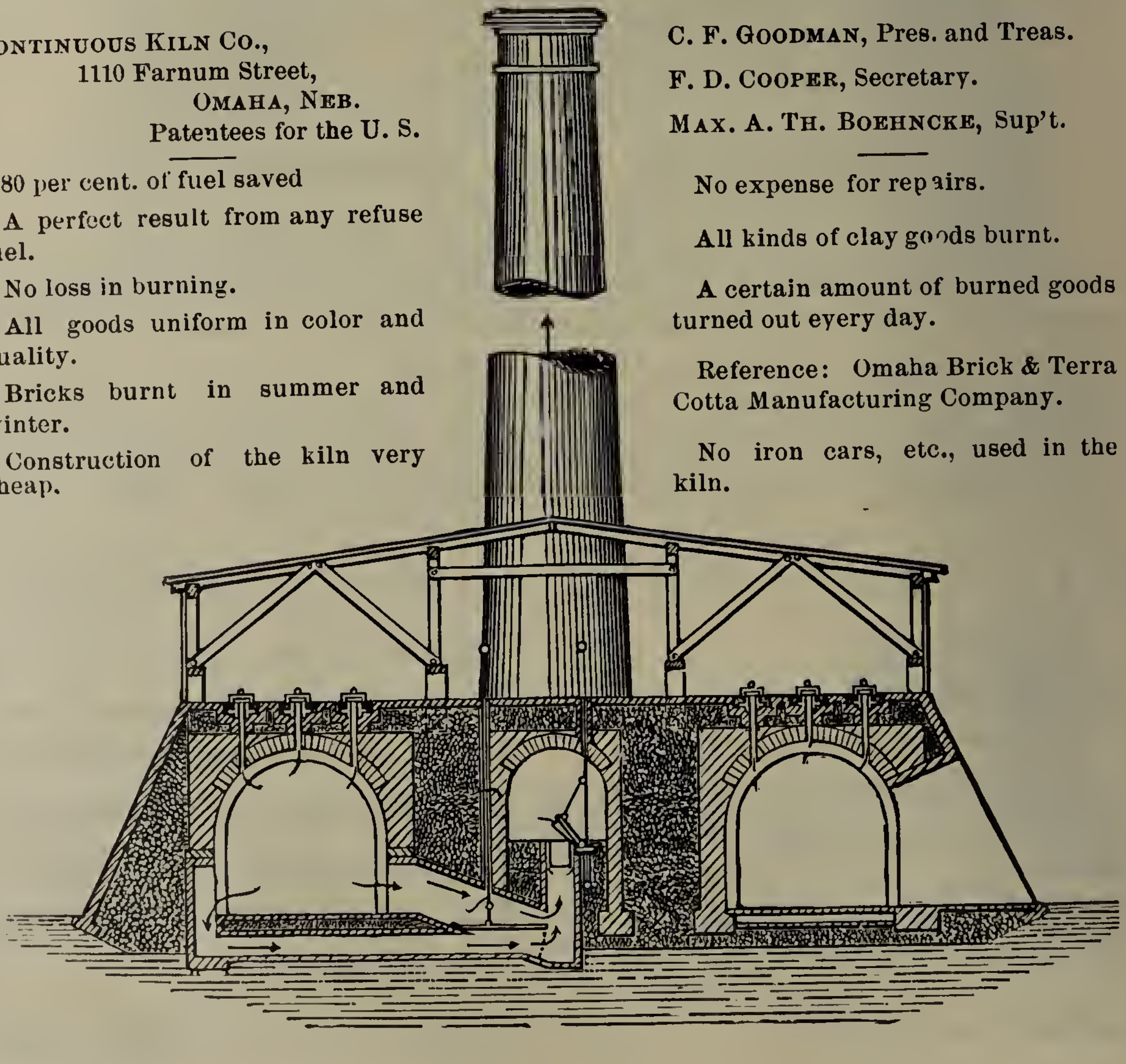
No expense for repairs.

All kinds of clay goods burnt.

A certain amount of burned goods turned out every day.

Reference: Omaha Brick & Terra Cotta Manufacturing Company.

No iron cars, etc., used in the kiln.



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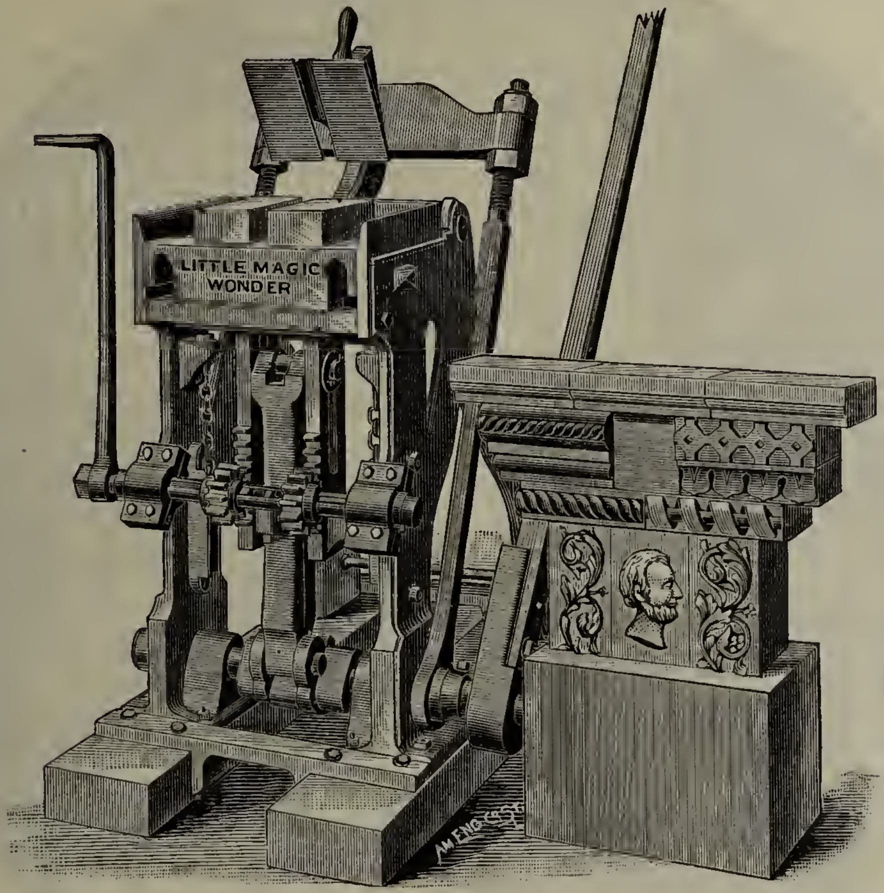

Hear What a Prominent Brickmaker Says:

St. Louis, Feb. 3d, 1889.

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DEAR SIR—At the end of a fair and satisfactory trial of your Little Magic Wonder Dry Clay Hand Brick Press, it affords me great pleasure to testify to its efficiency for the purpose intended. I had long been looking for just such a Press, whereon at short notice and at very slight expense we could, within a few hours' time get out small orders for ornamental bricks of special designs and patterns without interfering with the operation and working of our regular machines. The great value of your Hand Press to me, lies in the fact that we can make bricks upon it by pressure on edge as well as flat wise, thus enabling one to make almost any conceivable design of fancy moulded ornamental bricks. As you let your machines go out on trial there can come no loss to parties intending to purchase. Very Respectfully, ANTHONY ITTNER.

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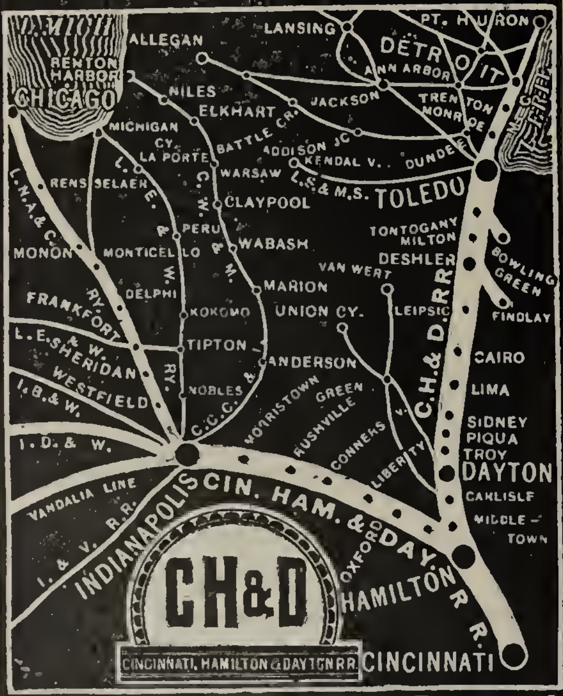

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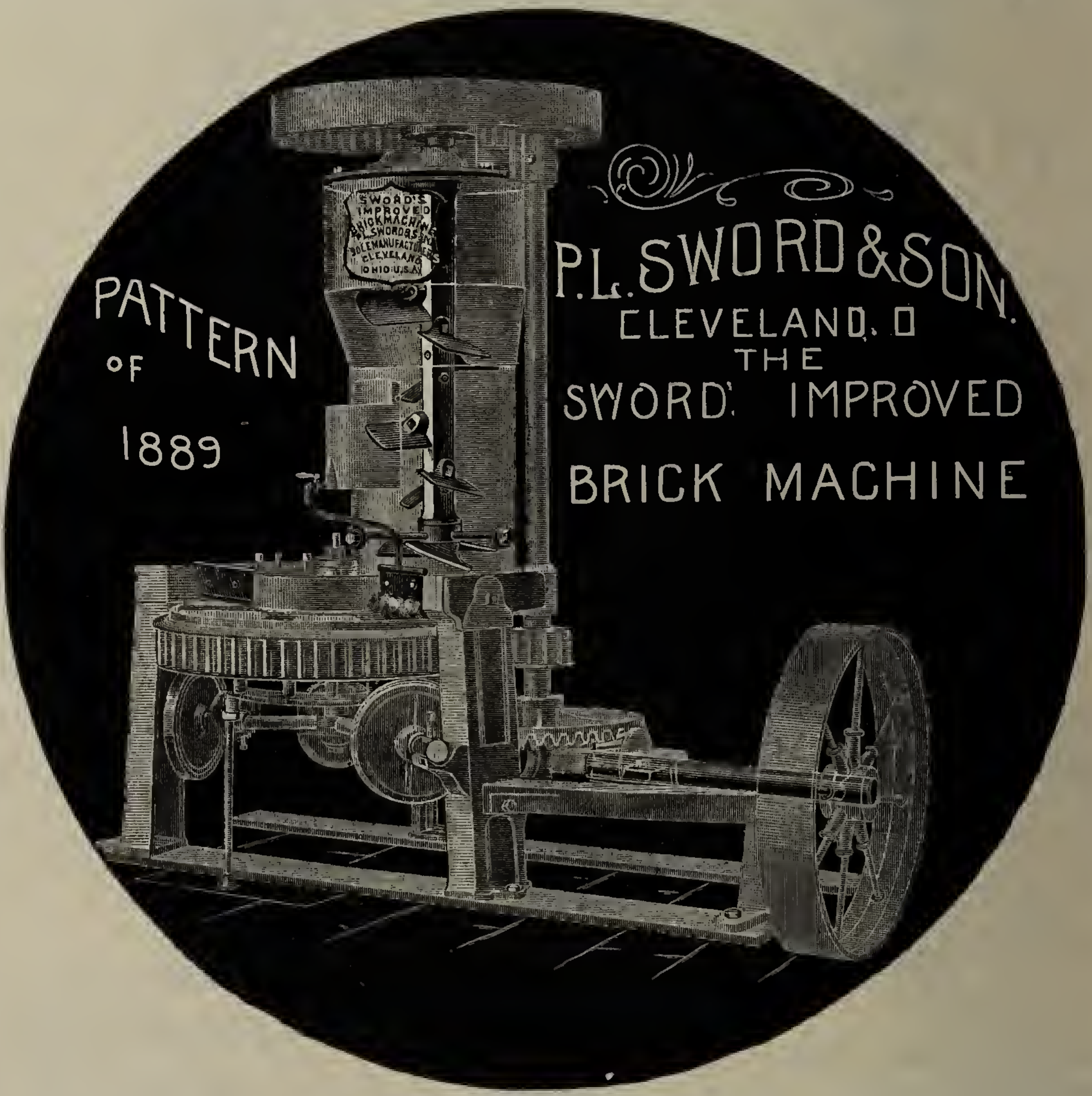

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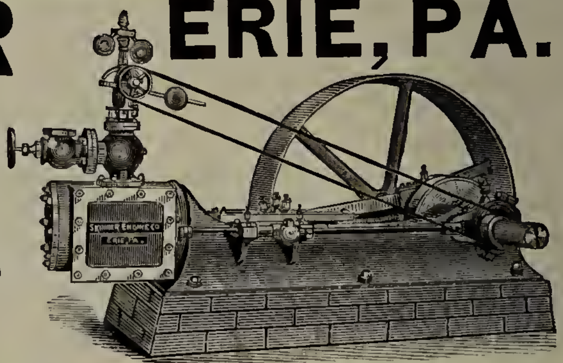

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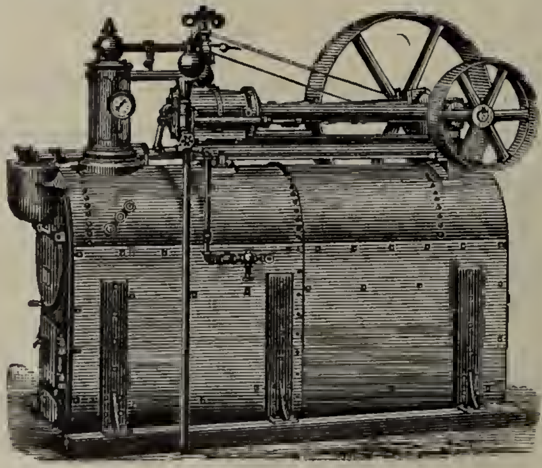

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IOWA PIPE AND TILE CO.,
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Borden, Selleck & Co., Chicago. GENTLEMEN—We have used the Harrison Conveyor for the past two years. It takes about 90 tons of clay per day from our dry pan and distributes it through our cellar. Gives good satisfaction. Yours Truly, IOWA PIPE & TILE CO.

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PIKE & SCHOPP, INVENTORS.

It Heads the Procession!

The "New Discovery" is a round down draft kiln with no grates, furnace doors, sub-arches or dampers, except at the stack, bound with iron bands, securely fastend to an arched irn door frame. This kiln is the result of years of experience by practical and successful tile and brickmakers, at a cost of thousands of dollars.

It is a conceded fact that perfect drafts and perfect combustion are indispensable to a perfect kiln. *Such* is the "New Discovery." This kiln is adapted for burning almost anything made from clay; can be constructed for either wood or coal and burn evenly throughout; is easily managed—will save in fuel, time of burning, wages of the burner, use of the kiln—nearly one-half.

The proprietors of this invention propose to sell kiln yard or territorial rights reasonably and guarantee it to be the best kiln the purchaser ever saw or used.

Everybody is cordially invited to visit our works, where a kiln is, almost, in constant operation. We also nave an arched iron door frame which is indispensable to a perfect kiln.

Send for circulars and testimonials.

We shall protect our patents from infringements.

Reliable resident agents wanted. Address—

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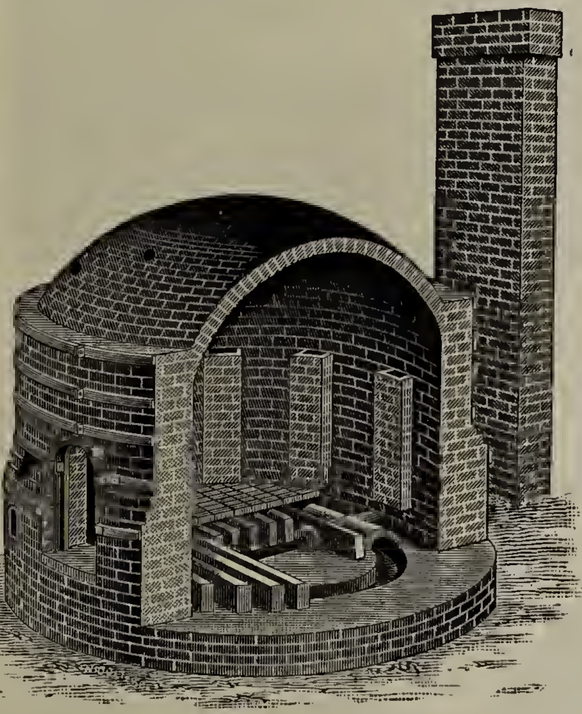

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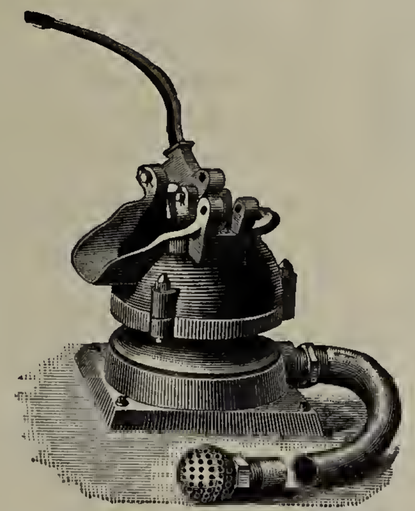
Gallons of Water (per hour.)

BY HAND-POWER.

Pumps, Hand-Power Pumps

(LOUD'S PATENT.)



These pumps are simple, durable and low-priced.

A large capacity and easy working pump for **Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries,** or wherever it is desired to raise a *large quantity* of water by *Hand-power.* The pump has large valves (*accessible by hand*) and will pump water containing *sand, gravel, mud, sewage matter, etc.,* without *choking* or any *perceptible wear.*

Send for circular and price-list. Manufactured by

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And the reason for it being is apparent to all those who travel between the East and the West. Its trains run solid from Indianapolis to St. Louis, and the service is conceded to be unequalled. Comfortable day coaches, that are kept tidy and clean, handsome and elegantly furnished parlor cars with easy sofa chairs go to make the trip from Indianapolis to St. Louis a pleasure rather than a hardship. Pullman sleeping cars are run on day and night trains, a local sleeper is also run for the convenience of local travel between Indianapolis and St. Louis, and passengers can get into the car at or near the Union Station any time after 8:30 P. M., and will not be disturbed until St. Louis is reached at 7:00 A. M. Rates are always as low as by less important routes. Through express trains run as follows: Leave Indianapolis 7:30 A.M., 11:55 A. M., 11:00 P. M. Arrive St. Louis, 5:00 P. M., 7:30 P. M. and 7:00 A. M., respectively.

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F. L. HALLS'

IMPROVED

BRICK AND TILE KILN.

This Cut is a Representation of the Patentee's Works.

In this invention I do not claim perfection, for progress is onward. There is no end to human achievements. This I do claim, that the quality of the bricks it turns out, is as good as the best; being nearly all hard burned brick. That it takes less time, less labor, and consequently less fuel in burning than any other plan of brick kiln in use, and it is easily operated.

DESCRIPTION OF BRICK KILN AND FURNACES.

The peak holes not shown are the same as in the common case brick kilns, thus enabling one to see the state of the arches when burning. Fig. 1, is a front or side elevation with wall removed, which plainly shows the green brick kiln as it is built over the permanent mason work. Every bench alternately resting on the furnaces and the mason work which is the kiln floor. this floor is a perfect support to the crown of the furnaces. D. D. are the arches of the green brick kiln, B. the furnaces, b. b. the hot air chamber of flues. Fig. 2, is a horizontal section, showing the plan of the furnaces. B. represents the floor of grate surface, b. b. the hot air chambers. The way of the arrows show how the heat is circulated from the rear end of the furnace on each side horizontally in the hot air chambers, from thence vertically through the kiln floor or partition, having apertures into the arches of the brick kiln.

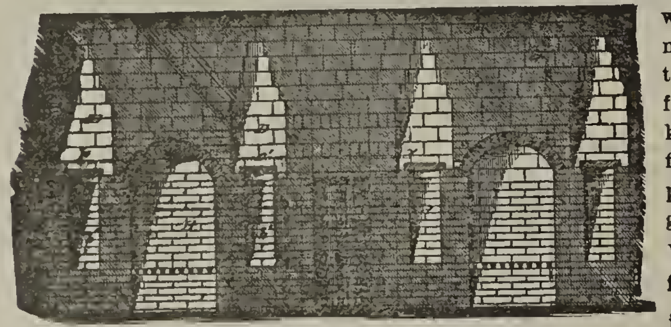

FIG. 1.

This brick kiln burns the brick of even hardness with but little fire marks. The arrangement of these furnaces are complete for perfect combustion. Also, in heating the arches of the brick kiln, there is no plan of furnaces that can equal them. The arch brick is hardly discernable and as perfect as any in the kiln.

I do not want a score of writers in their bearings to recommend this kiln *but let it stand on its own merits.* Every experienced brick maker knows that air let in through apertures at the sides or rear of furnace, it matters not in what shape, it will have a tendency to dampen the fires and cool the arches, the same will be the results, if in the rear holes it comes through the bed of coal while burning.

I have been many years engaged in the manufacture of brick, after experimenting and bringing this kiln as near perfection as it needs to be, I now offer to the brick makers yard rights, and right of terriiory, at reasonable prices, and am confident that such as may deal with me, after bringing into use this new arrangement for burning brick, will feel fully repaid for all their expenses.

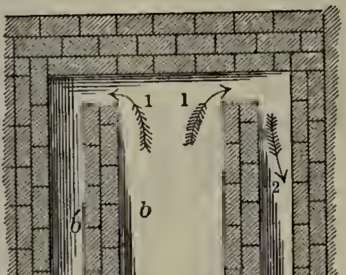

FIG. 2.

Any further information, as regards costs of Brick Kiln, construction of Furnaces, and all particulars will be cheerfully given by addressing

F. L. HALL, Patentee,
Oneida, Madison Co., N. Y.

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This system of railroads embraces the following lines: The Chicago, St. Louis & Pittsburgh railroad; the Jeffersonville, Madison & Indianapolis railroad, and the Indianapolis & Vincennes railroad.

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The facilities and advantages of the Pan-Handle System are in very particular in keeping with the progressive spirit of the times and the demands of the traveling public Its facilities for the transportation of its patrons are sufficiently adequate to guarantee to all comfortable and pleasant accommodations.

The prominent advantages are its Through Coach and Sleeping Car service; Through Ticket and Baggage Check System; Prompt Connections and Speedy and Safe Transit.

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Hannibal	9.35 pm.	10.40 am.
Quincy	9.50 pm.	10.45 am.
Keokuk	11.15 pm.	11.35 am.
St Louis	6.15 pm.	7.45 am.
Peoria	5.45 pm.	9.55 am.
Kansas City	7.10 am.	6.30 pm.

The only line runing reclining chair cars daily between Indianapolis and Keokuk, Ia., without change, running through Decatur, Springfield, Jacksonville, Chapin, Bluffs and Clayton, Ills. To Quincy, Ills,, and Hannibal, Mo., without leaving the train.

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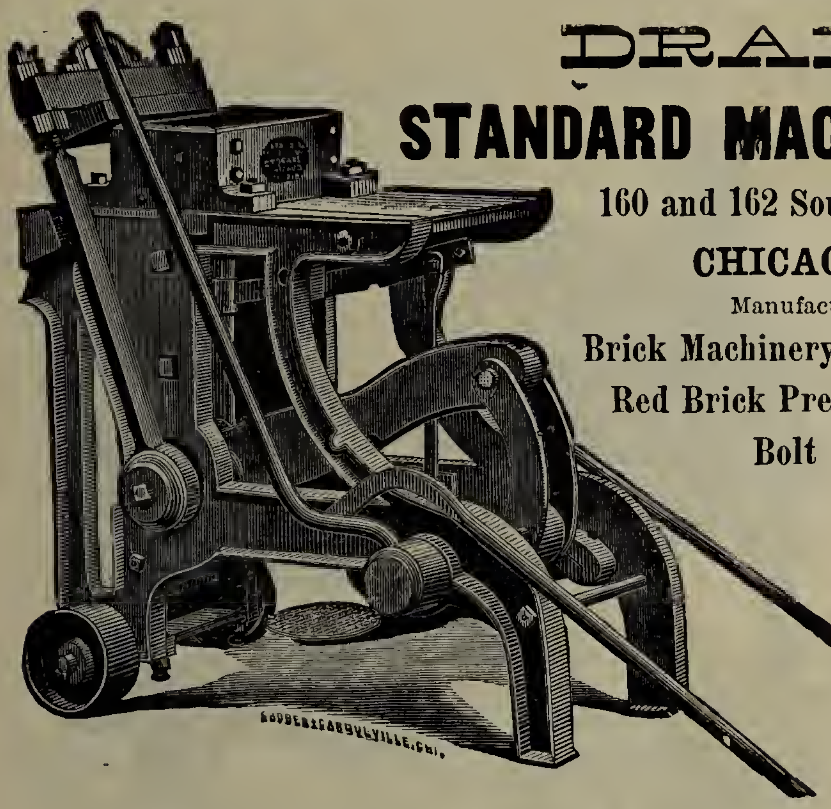

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160 and 162 South Clinton St.,
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Manufacturers of all kinds of
Brick Machinery, Clay Crushers, Fire and Red Brick Presses, Hydraulic Presses, Bolt Headers, etc.

This cut represents our Patent Press with change of liners in same Press Box for different styles of brick.

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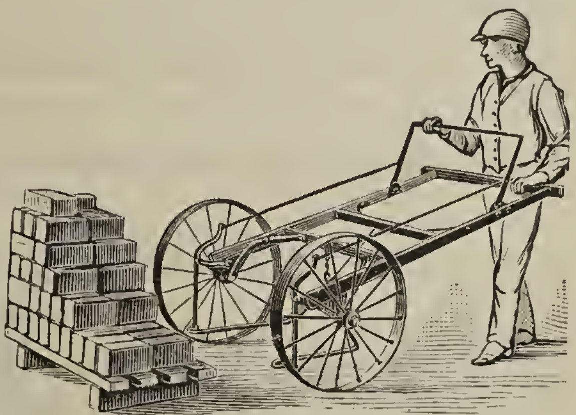
WE GIVE THESE AS REFERENCES:

Best in the market for stubborn clay and to separate stones from same. Number used by brickmakers in Chicago: Alsip Brick Co., 3; Hayt & Alsip, 4; J. B. Legnard, 2; May, Purington & Co., 1; Wahl Bros., 2; John Busse, 1; Union Brick Co., 1; Chicsgo Brick and Mill Co., 1; Weckler Brick Co., 1; Adam J. Weckler, 1; L. Weirheim & Son, 1; John Sexton, 1; Chicago Brick Co., 2.

STEELE'S IMPROVED Brick Truck —AND— Portable Hack.



The principle of handling and drying bricks by the Portable Hack System has been perfected in this Truck and VENTILATED HACK BOARD, being the most practical Truck and method ever yet introduced, saving labor in handling and time in drying bricks. Can be used in any yard not too steep. Is especially adapted for medium dry clay machines.

☞Is fully warranted to work as represented.

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The Invincible Brick Machine.

The STRONGEST, MOST DURABLE and BEST BRICK MACHINE in the market. Write for full description, prices, etc., to

EAGLE MACHINE WORKS CO., Indianapolis, Ind.

We will fully guarantee this machine to have all the desirable qualities known in Brick Machines. Each and everyone put to the buyer on its own merits.

We are making over 2500 Fire Brick per hour all day long.

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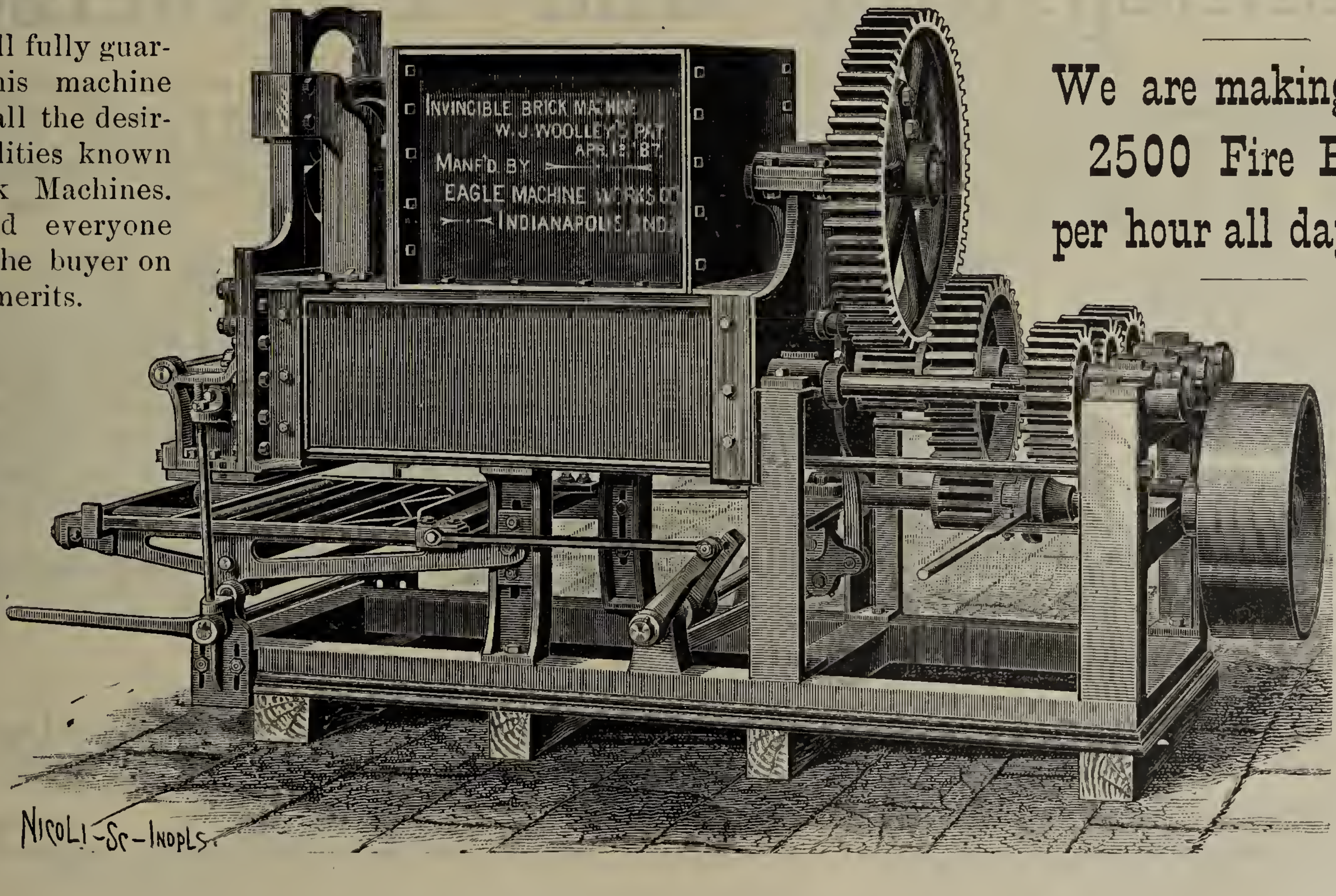
INVINCIBLE BRICK MACHINE
W. J. WOOLLEY'S PAT.
APR. 12 '87.
MANF'D BY
EAGLE MACHINE WORKS CO.
INDIANAPOLIS, IND.
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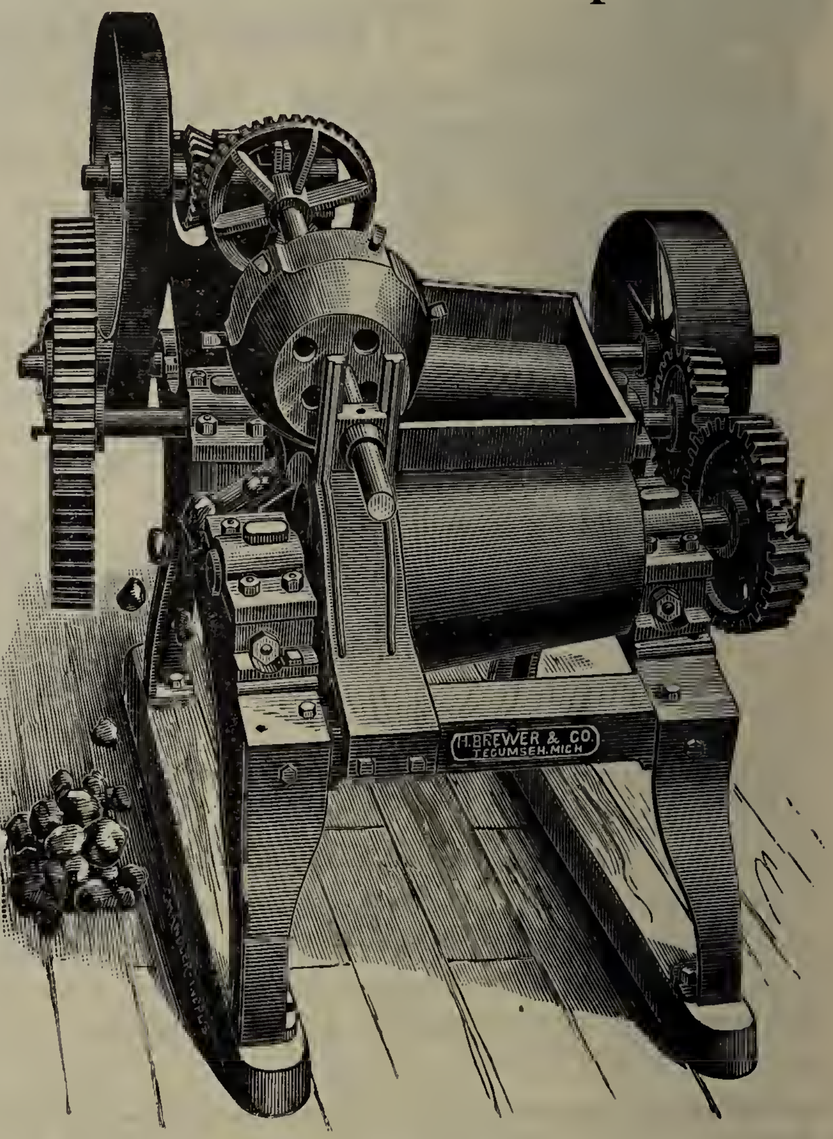
H. Brewer & Co's. Clay Crusher and Stone Separator.

The prominent feature in this Crusher is the combination of two smooth, tapering crushing rolls, running at different speeds, in connection with an adjustable transverse roll which is of irregular form and provided with teeth or spurs, whereby the clay is rapidly broken up and crushed, and the stones separated therefrom.


H. BREWER & CO. TECUMSEH, MICH.

TESTIMONIALS.

Saunemin, Ills., May 18th, 1888.

H. Brewer & Co., Gentlemen—Your Crusher works to a charm and we are very highly pleased with it. It runs one-half easier than any other Crusher we have had.

Yours Truly,
SAUNEMIN BRICK AND TILE CO.

Budd, Ills., May 3d, 1888.

H. Brewer & Co., Dear Sirs—The Crusher and Elevator work to my entire satisfaction. I feel confident I would be $2,000 ahead, to-day, had I put in your Machine and Crusher at the start.

Yours Truly,
HENRY SIEDENTOP.

Monroe, Iowa, May 15th, 1888.

H. Brewer & Co., Gentlemen—The Crusher is giving good satisfaction and I think will do all that is claimed for it.

Yours,
T. P. BURCHINAL.

☞Do not fail to obtain our prices on Tile Machines, Brick Machines, Pug Mills, Clay Crushers, etc. For illustrated Catalogues and Price List, address

H. BREWER & CO.,
Tecumseh, Mich.

(Mention Clay-Worker.)

STEDMAN'S IMPROVED
Disintegrator and Pulverizer.

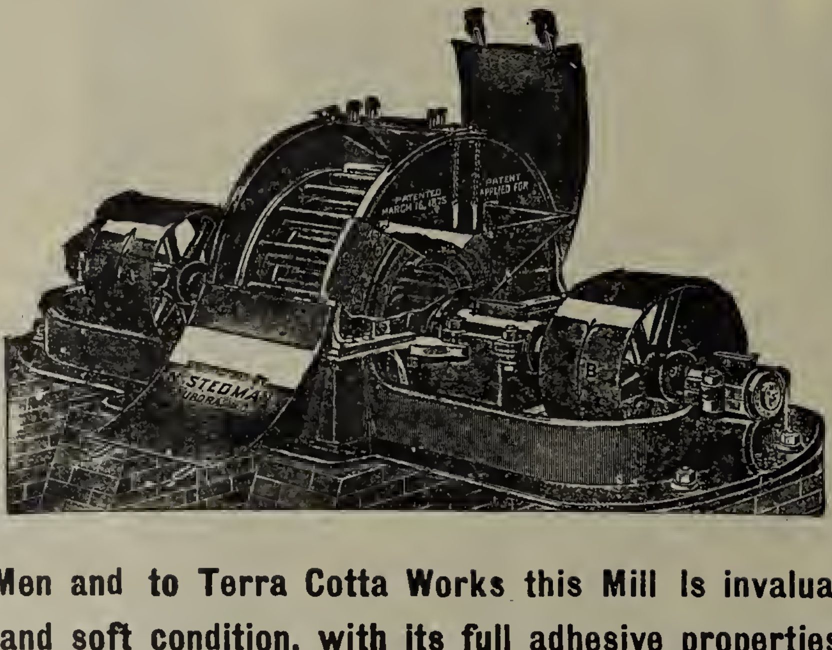
This mill will disintegrate or pulverize the following materials:

Clays of all kinds, Shale and Slate direct from the bank, for Brick and Tile.

Fire Clay and Sand Stone Rock—for Cement and Fire Brick.

Iron Ores of various kinds, Guano, Phosphates, Bones—green, dry steamed, Tankage, Bone-Ash, Salt Cake, Soda, Cracklings, Oyster Shells, Animal Matter in almost all conditions, Old Fire Brick and Tiles.

Old Pottery Ware, Plastic Clay, Asbestos, and in fact almost any material that can be disintegrated.



A good Disintegrator and Pulververizer is a long felt want in many branches of business. This Mill is an improvement over any yet made and is the result of practical experience.

This Mill is made in three sizes: 34, 40 and 48 inches. The capacity for clay is as follows:

34 inch Mill will pulverize for from 15,000 to 25,000 brick per day.
40 inch Mill will pulverize for from 20,000 to 35,000 brick per day.
48 inch Mill will pulverize for from 75,000 to 100,000 brick per day.

To Brick, Tile and Pottery Men and to Terra Cotta Works this Mill Is invaluable. It reduces the clay to a fine, light and soft condition, with its full adhesive properties retained.

For Prices and any other Information, Address

Stedman's Foundry and Machine Works,

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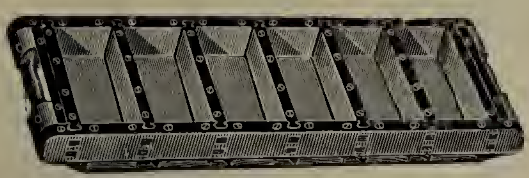
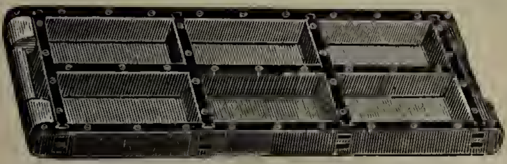
PROTECTED BY PATENTS.
[Mention the Clay-Worker.]

6 B. MACHINE MOULD.



6 B. HAND MOULD.



3 B, HAND MOULD.

D. J. C. ARNOLD,

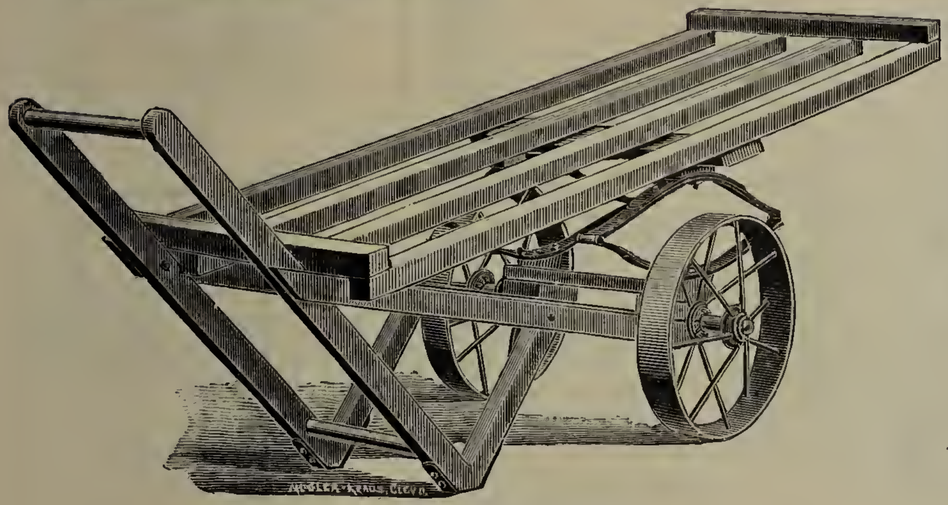
MAKES ∵ BRICK ∵ YARD ∵ SUPPLIES

At NEW LONDON, OHIO.

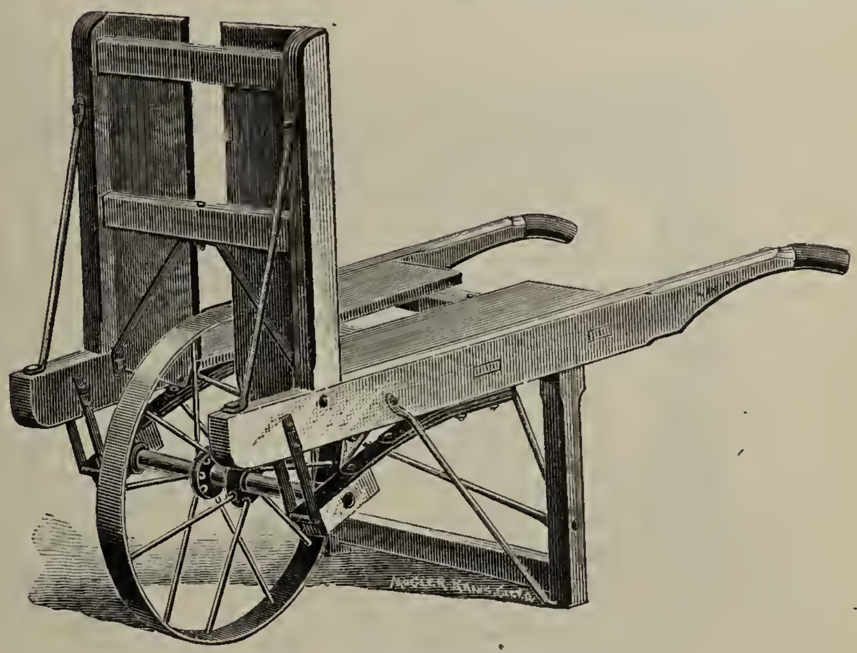
Get his prices before you buy. **All goods first-class in every respect.**

[Mention the Clay-Worker.]

☞Catalogue sent on application.



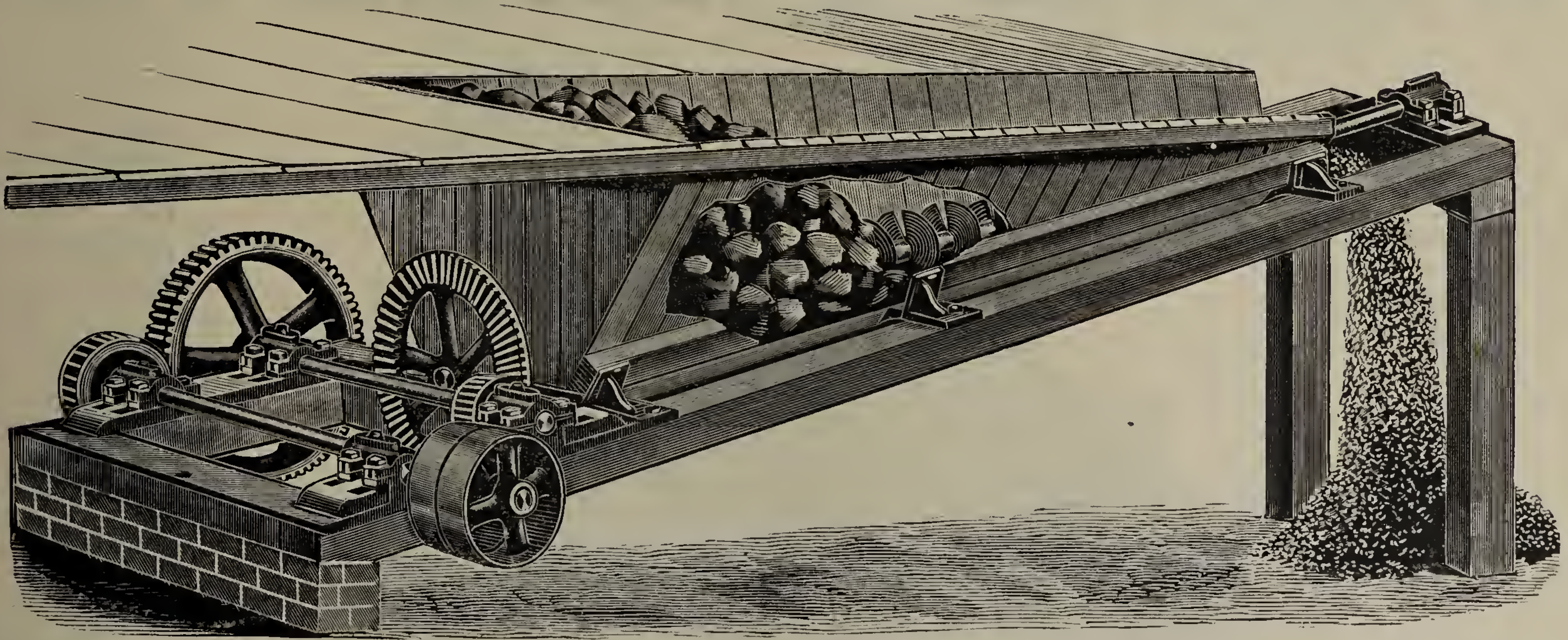
NO. 10 SPRING TRUCK.
(Weight 100 pounds .)



NO. 1 BRICK BARROW.
(Weight with springs 100 lbs.)

Emen's Patent Perfection Clay Cranulator and Feeder.

SOLD SUBJECT TO TRIAL AND APPROVAL.



Saves time and labor and produces better ware; simple in construction; rapid and accurate in operation. Every brick, tile and sewer pipe manufacturer should investigate the merits of this machine.

During the past season it was introduced in several of the leading Chicago brickyards and is now at work giving entire satisfaction. Write for descriptive circulars.

Chambers Brothers Company, of Philadelphia, Pa., are licensed to manufacture and sell these machines.

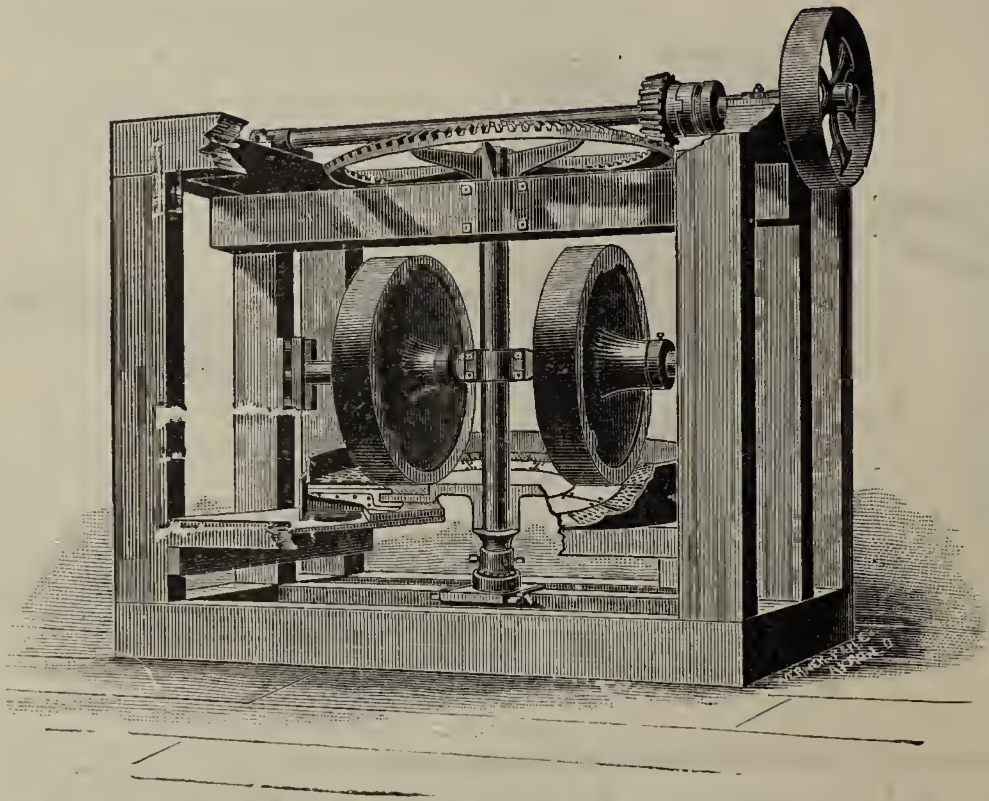
EMENS AND COLE

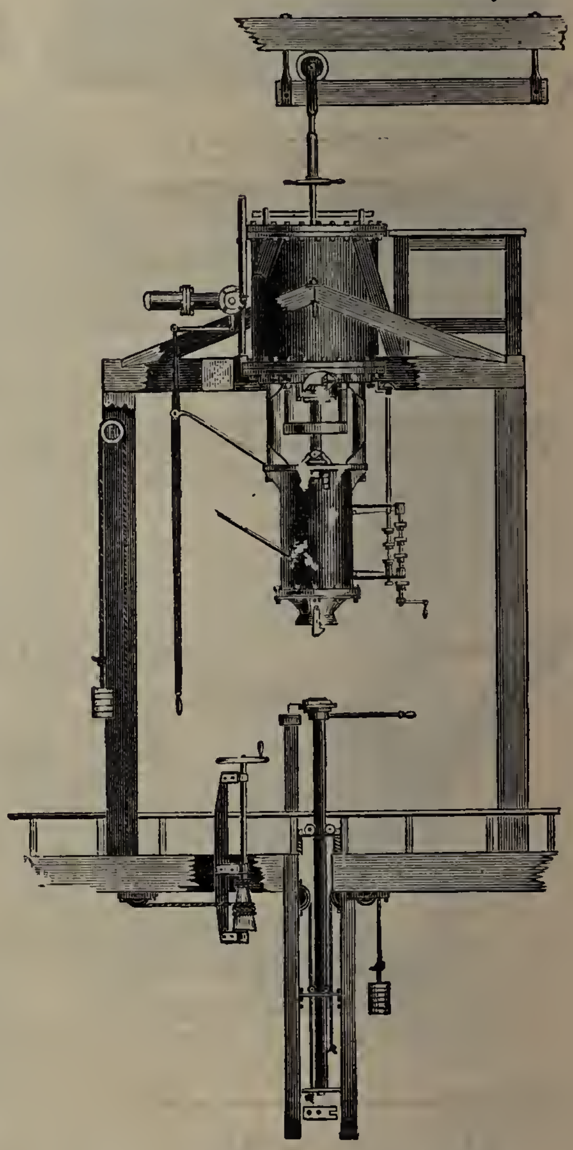
[Mention Clay-Worker.] HOLTON, (MUSKEGON CO.) MICH.

TAPLIN, RICE & CO.,

AKRON, O.

Manufacturers of Improved Clay Working Machinery of all kinds, such as Clay Mills, Dry and Wet Pans, the Barber Steam Sewer Pipe Press, Dies, Clay Blockers, Potters' Wheels and machinery of every description. Write for circulars.





BRICK PALLETS.

Brick Pallets.

Brick Pallets.

PIPE BOARDS, ROOFING LUMBER Supplied Direct in Carload Lots.

When writing for prices, give an exact description of the kind of pallet wanted, as different pallets are in use in different sections of the country. State whether cleats are to be nailed on; also length, width and thickness of the pallet. We have a big trade in this line and can save you one profit. Write for prices.

W. B. MERSHON & CO.,

Manufacturers of all kinds of white pine lumber and packing boxes in shooks.

East Saginaw, Mich.

THE PENFIELD STIFF CLAY MACHINES

Are UNEXCELLED For the Manufacture of

COMMON BRICK, FACE BRICK, ORNAMENTAL BRICK,

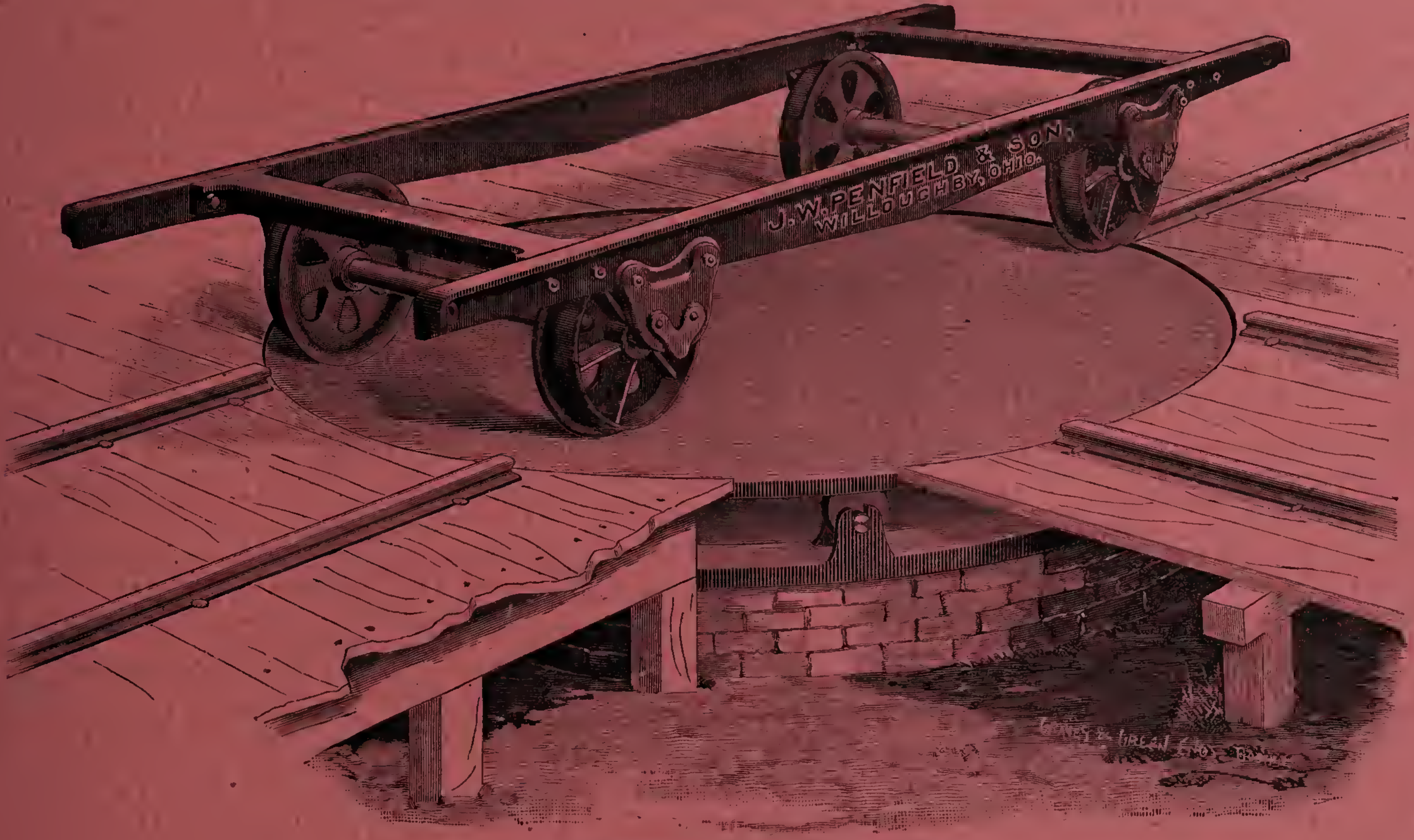
Paving Brick,

FIRE PROOF BUILDING MATERIAL, TERRA COTTA LUMBER.

Machines of all Capacities, from 15,000 to 80,000 per day.

Complete Outfits a Specialty.

We handle Engines and Boilers. Our Patented Steam Drier is the Best.



Turn Table and Iron Dry Car.

We make a full line of Iron Dry Cars, single or double decked, Transfer Cars, Turn Tables, Etc., for Any Dryer. Write for particulars.

WE MANUFACTURE

Brick Machines; Tile Machines; Pug Mills;
Clay Crushers and Stone Separators; Granulators;
Elevators; Kiln Castings; Yard Supplies.
Pulleys, Shafting, Hangers, Couplings, Etc., Etc.

☞ For full particulars address the manufacturers,

J. W. PENFIELD & SON,

WILLOUGHBY, OHIO, U. S. A.

[Mention the Clay-Worker.]

J. W. PENFIELD & SON, - - Willoughby, Ohio, U. S. A.

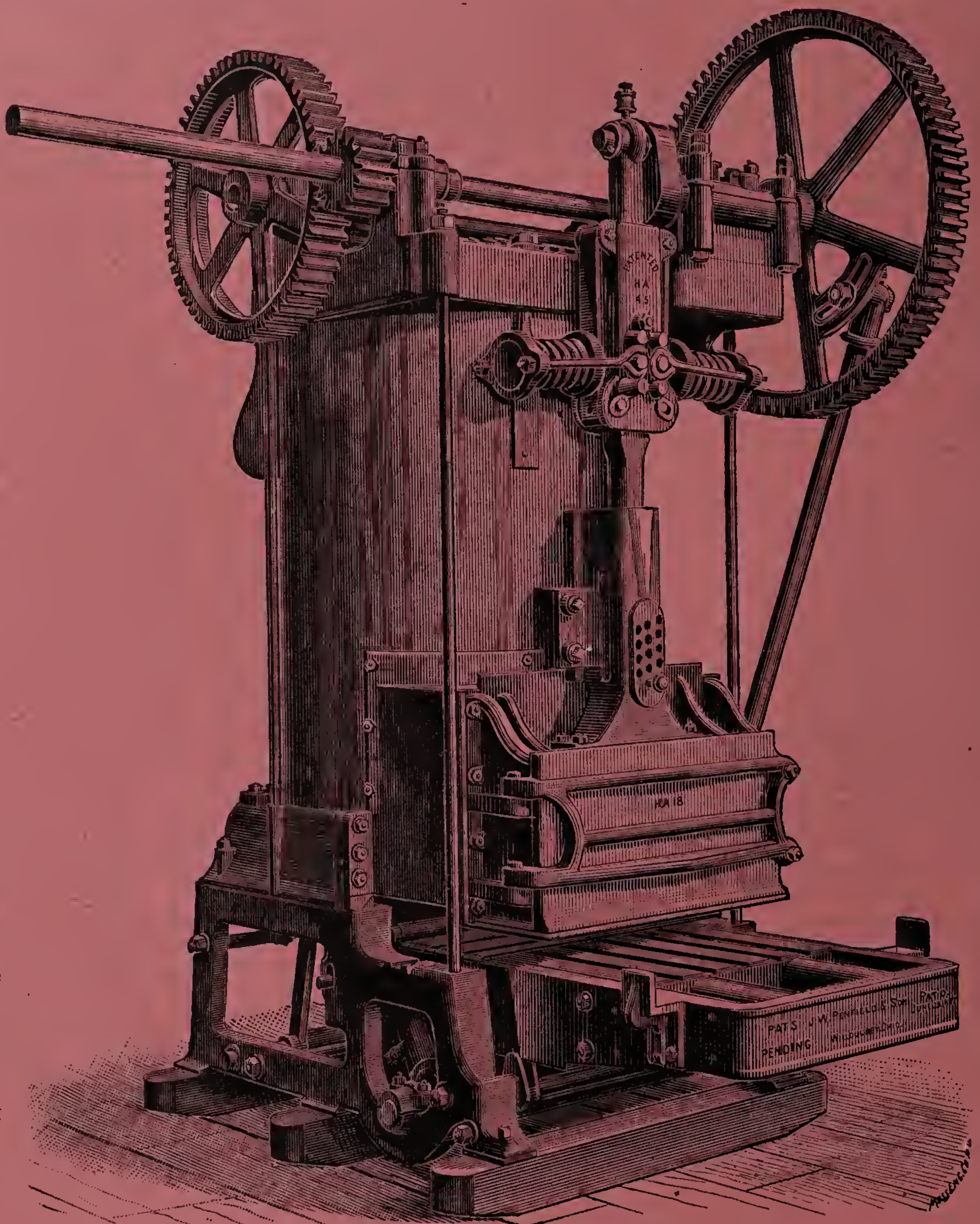
That the wide awake brickmakers appreciate a good thing, is shown by the large number of orders we are receiving for our Upright Stock Brick Machine. All who have seen it pronounce it the

STRONGEST,

MOST PRACTICAL

AND BEST

sand moulding machine made.


PATENTED
PATS. J. W. PENFIELD & SON. PATENTED
PENDING WILLOUGHBY, OHIO.

All the brick are perfect in shape, with good sharp corners, and of equal density, in fact perfect stock brick, and if repressed will make first-class press brick,

ALL

UNIFORM IN

SIZE.

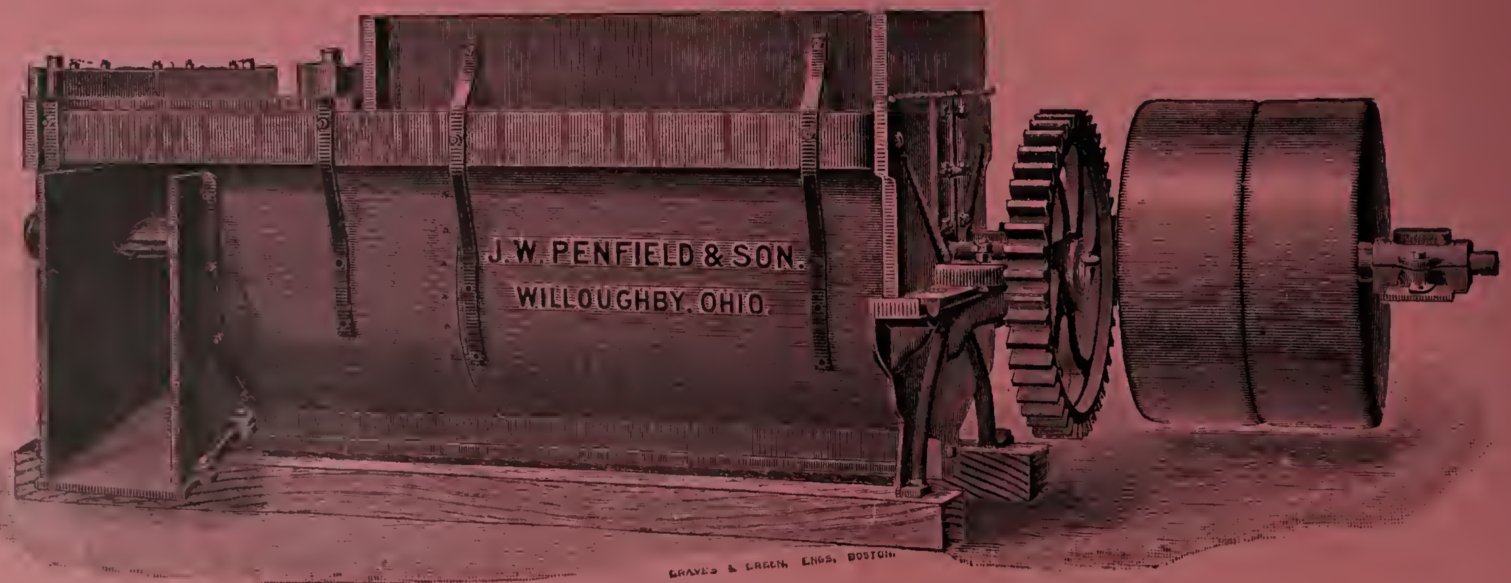
No sticking to the moulds.

The Penfield Stock Brick Machine. All Iron and Steel.

Furnished either With or Without Direct Attached Pug Mill.

Separate gearing for doing the pressing and pugging; Extremely Heavy; Perfectly Rigid; No wooden parts to decay; Light Running; Makes 6 of the largest sized brick in each mould.

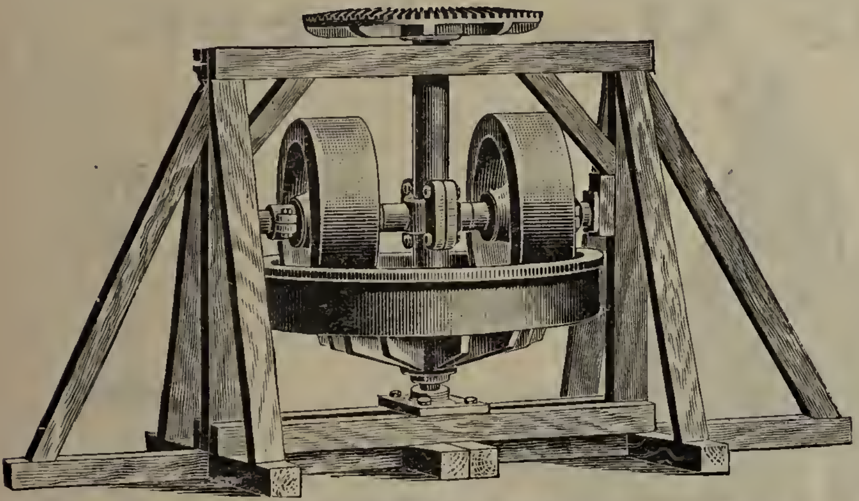
Unexcelled for Pugging Clay for Sand Moulded Brick.


J. W. PENFIELD & SON.
WILLOUGHBY, OHIO.
GRAVES & GREEN ENGS. BOSTON

Send for Description and Prices.

HORIZONTAL SOFT CLAY PUG MILL.

THE FROST
Dry & Wet-Pan Crushers, Chasers, Etc.,



—FOR—

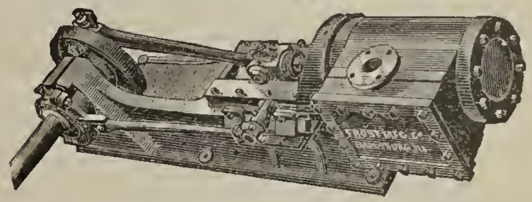
BRICK, TERRA-COTTA, SEWER PIPE AND FIRE CLAY.

—o—

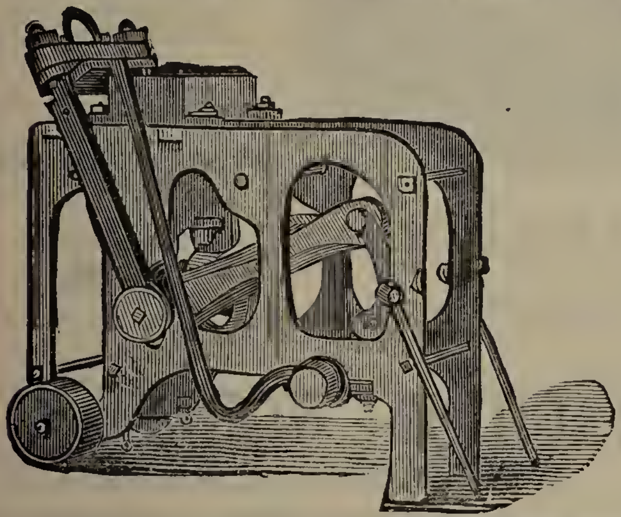
The best and cheapest machines made for working hard clay, soap stone, grog, etc.

Write for prices and other information.

THE FROST ENGINE Co.
GALESBURG, ILL.
ALL SIZES UP TO 150 H.P.



ELEVATOR SUPPLIES
PULLEYS, SHAFTING, SPROCKETS, BUCKETS, BELTING, SHELLERS, CLEANERS, MILLS, &c.
SEND FOR CATALOGUES



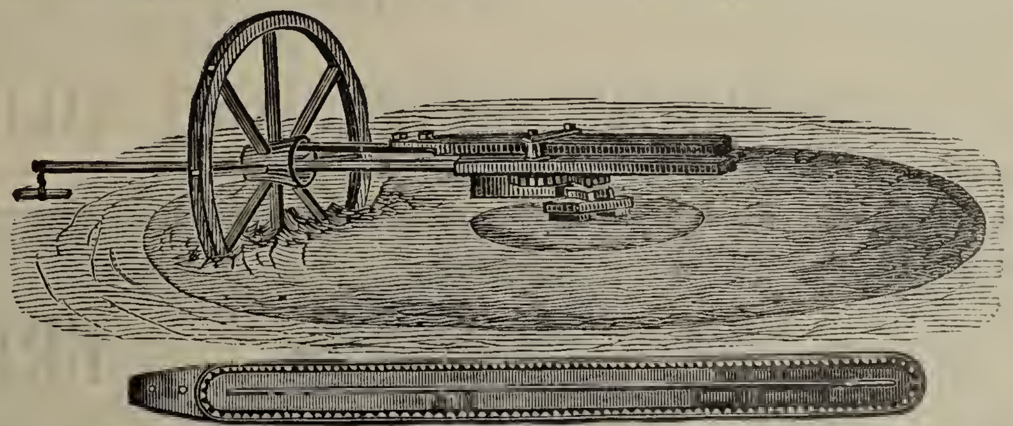
RED BRICK PRESS.

GEORGE CARNELL,
Nos. 1819 and 1821 Germantown Avenue,
and Fifth St.,
PHILADELPHIA, PA.

☞Send for Circular and Price-List.

Philadelphia Brick Machine Works
—MANUFACTURER OF—
FIRE AND RED BRICK PRESSES.

Various sizes, from the smallest size up to 24 inches; also, manufacturer of **Clay Mills, Tempering Machinery,** and all kinds of **Brickmakers' Tools.**



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and is fitted up ten per cent. cheaper. ☞Mention THE CLAY WORKER.

ESTABLISHED 1812,
AND CONTINUED ON THE SAME PREMISES EVER SINCE.

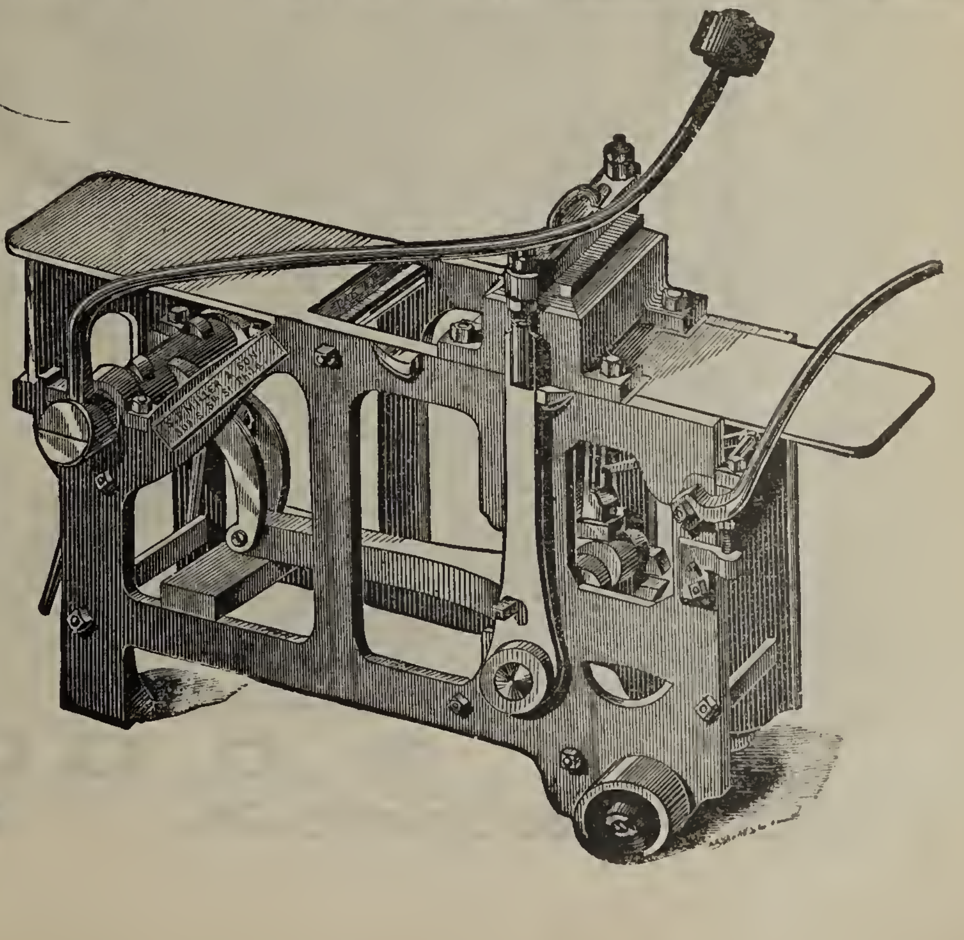
MILLER'S
BRICK PRESSES,
Introduced 1844 Latest Improved Patents, Aug. 28, 1883.

SAMUEL P. MILLER & SON,
MAUFACTURERS OF
RED AND FIRE BRICK PRESSES,
Of five different styles, embodying all the improvements in Hand Brick Presses in use.

Clay Wheels with Reciprocating Rack, Kiln Castings, Brick Moulds, Clay Spades, and the Tools in General Use for Brick Making.

No. 309 SOUTH FIFTH ST., PHILADELPHIA, PA.

S. P. M. & Son refer to Brickmakers generally. ☞ Orders from abroad promptly attended to.

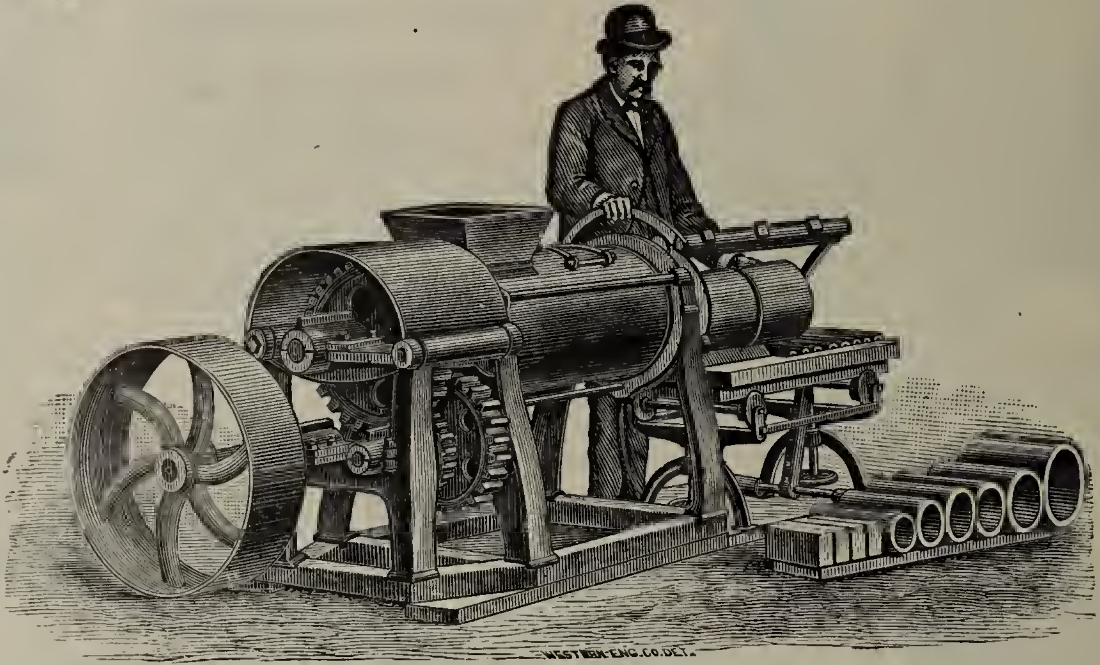


MICHIGAN BRICK AND TILE MACHINE WORKS,

—MANUFACTURERS OF—

Brick and Tile Machinery.

Our new CUT-OFF TABLE for side cut brick, cuts either way and is worked by a cam, thus enabling us to cut on a circle and to make a brick when dry and burned that is absolutely perfect. Side cut brick when cut straight are always warped, especially brick made by auger machines. Our invention overcomes this objection and it is the only cut-off made that will produce a perfectly straight brick when burned. This cut-off can be used on any machine.


WESTERN ENG. CO. DET.

The Michigan Brick and Tile Machine.

TWO SIZES { No. 1 makes tile from 2½ to 12 inches.
No. 2 makes tile from 2 to 8 inches.
Either Side or End-cut Brick.

1856.

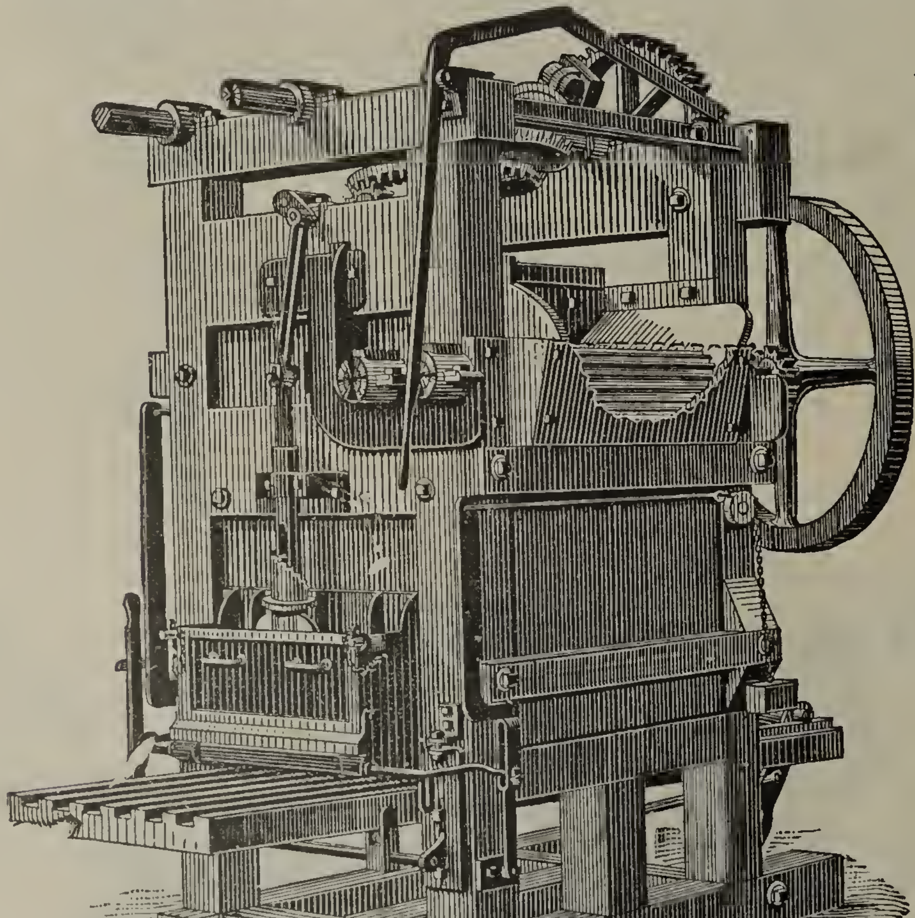
Thirty-three Years

of

Practical Experience.

1889.

MICHIGAN BRICK AND TILE MACHINE WORKS.
Lenawee County. MORENCI, MICH., U. S.



GURNEY
BRICK MACHINE WORKS,

MILWAUKEE, WISCONSIN,

Manufacturers of

THE GURNEY BRICK MACHINE

—Having Crushers Inside of Pug Mill.—

THIS is the only Machine in use which has the *combination of Crushers, Mixing and Moulding Apparatus* in a single machine. The arrangement is covered by patent issued October 6, 1885.

This machine will work any clay, however hard and lumpy, with no preparation before soaking in the usual way.

The Crushers will take the clay through as fast as the machine will turn out the brick, *doing entirely away with lumps*, which brickmakers know have been much in the way of making good brick, and also have caused great loss by breakage.

The Machine will turn out four thousand, or more, good, smooth, square brick an hour. With proper moulding sand THE BRICK FROM THIS MACHINE, *made from any clay*, WILL SLIP EASILY. The Machine has been thoroughly tried in different parts of the country.

Also First-Class STEAM and HORSE-POWER MACHINES of same pattern, without Crushers.

For further information and Illustrated Catalogue address—

T. C. GURNEY,
100 Wisconsin St., MILWAUKEE, WIS.

THE STANDARD BRICK MACHINES

—MANUFACTURED BY—

A. M. & W. H. WILES,

Grassy Point, Rockland County, New York.

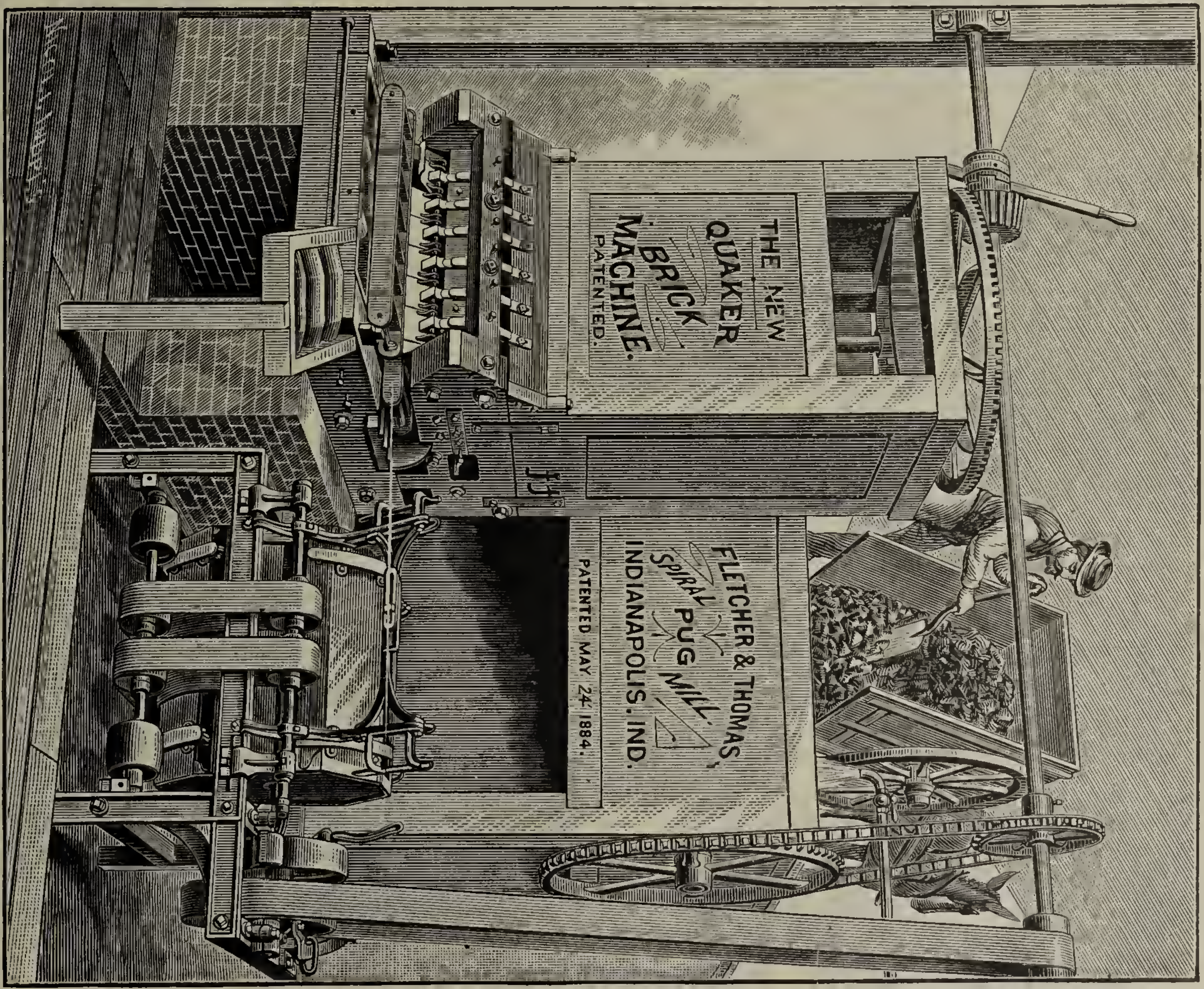
These Moulding Machines have been in constant use for over 30 years, and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.


THE NEW QUAKER BRICK MACHINE. PATENTED.
FLETCHER & THOMAS, SPIRAL PUG MILL INDIANAPOLIS, IND.
PATENTED MAY 24, 1884.

This outfit will make the largest number of the very best of Pallet Bricks at Least Cost of anything in the market. For further particulars, address

BENNETT BROS. & CO., Wellington, Lorain Co., Ohio.

THE Jos. J. Kulage Press Brick Machines Patented 1884, 1886, 1888.

Yield DOUBLE the Pressure of any other Brick Press (excepting the "Hydraulic") and are marvels of perfection.

☛ **A NEW ERA IN MAKING PRESS BRICK.** ☚

EVERY BRICK MANUFACTURER who intends or is making "Dry" or "Semi-Dry" Pressed Brick neglects his interests, if he fails to visit or correspond with the undersigned in regards to his system and machines. Works in operation day and night, all year (excepting December and January). Capacity: Daily 140,000 Bricks.

Our Fancy, Front and Stock Bricks are the only DRY-PRESSED Bricks made in the United States that are equal and SUPERIOR to those of the St. Louis "Hydraulic". We want a reliable Representative for the sale of our bricks in every large city.

JOS. J. KULAGE, President
College Hill Press Brick Works,

WORKS, near O'Fallon Park St. Louis, Mo. **OFFICE, 1435 College Avenue, ST. LOUIS.**

THE NEW IMPROVED

CHIEF BRICK MACHINE.

Patented Jan. 1, 1884, *April* 2, 1884, *and the new improvements of* 1887 *and* 1889

Has taken the lead and stands at the head of all Brick Machines, and is now in operation in every State and Territory in the Union.

In its original construction it was exhibited and operated at the great Southern Exposition at Louisville, Ky.; also at St. Louis, Mo., Kansas City, Mo.; Indianapolis, Ind.; Columbus, O.; Cincinnati, O.; Chicago, Ill.; and at each and all places where premiums were awarded the CHIEF carried off the first prize medal over all competitors.

And with the late new improvements added the CHIEF stands in perfection, at the head of human inventions.

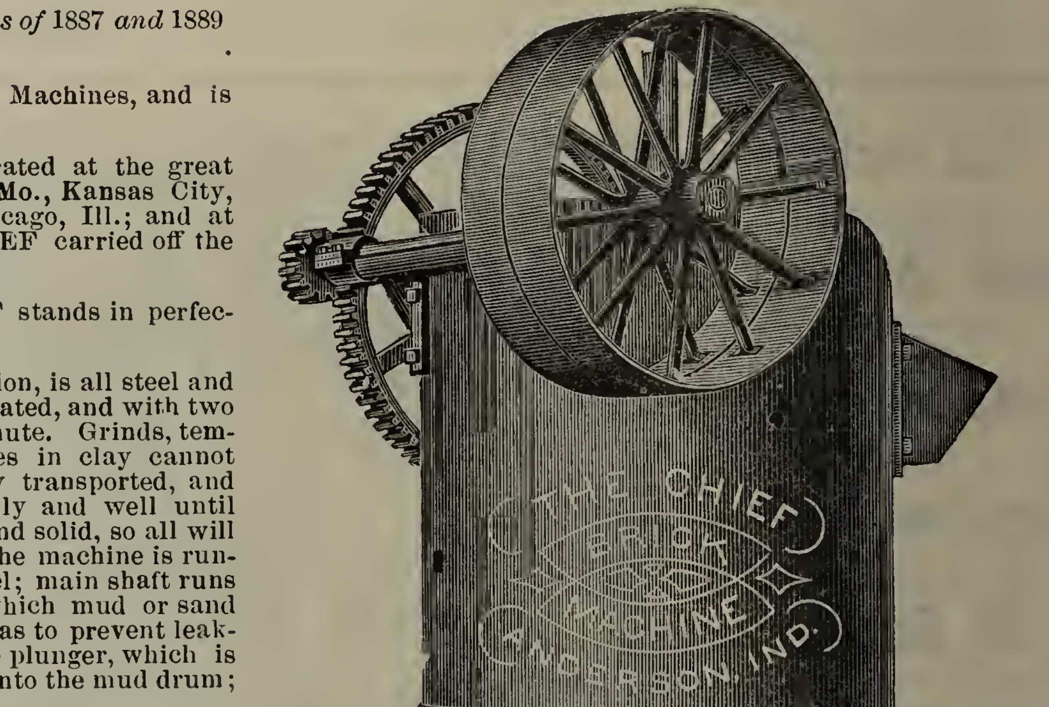
The NEW IMPROVED CHIEF is wonderful in operation, is all steel and iron, and of the greatest strength and durability, is easilyoperated, and with two horses or a small engine makes 60 to 100 perfect bricks per minute. Grinds, tempers and at the same time moulds into brick any clay. Stones in clay cannot break it, nor interfere with its free operation. It is easily transported, and changed from horse to steam power. It fills the moulds evenly and well until the machine is empty of clay, pressing each brick equally and solid, so all will shrink alike. The pressure can quickly be changed while the machine is running to suit the consistency of the clay. All shafts are of steel; main shaft runs in three boxes or bearings all outside of the machine into which mud or sand cannot penetrate. The wear can at all times be taken up so as to prevent leakage. The clay in the press box is under full control of the plunger, which is direct and positive, and prevents the mud from floating back into the mud drum; this feature is not found in any other mud machine.

Bricks made by the NEW IMPROVED CHIEF, are solid and perfect, and have sharp edges and corners, and do not crumble in burning.

The NEW IMPROVED CHIEF is equally suitable either for small or large yards, the best of bricks are made by it at the least labor and expense, all parts are easy of access and the bearings can be oiled from the outside. All ordinary sizes of brick as well as ornamental brick can be made on the NEW IMPROVED CHIEF and it is especially adapted to making fire brick of any shape with the least danger of breakage and the smallest per cent of lost brick.

The NEW IMPROVED CHIEF is sold on its merits, and warranted to be all that is claimed for it

We will send Circulars and Testimonials of the NEW IMPROVED CHIEF BRICK MACHINE, New Departure Tile Machine, Engines, Etc., Etc., free to any address on application. Address


THE CHIEF BRICK MACHINE ANDERSON, IND.

Anderson Foundry & Machine Works,

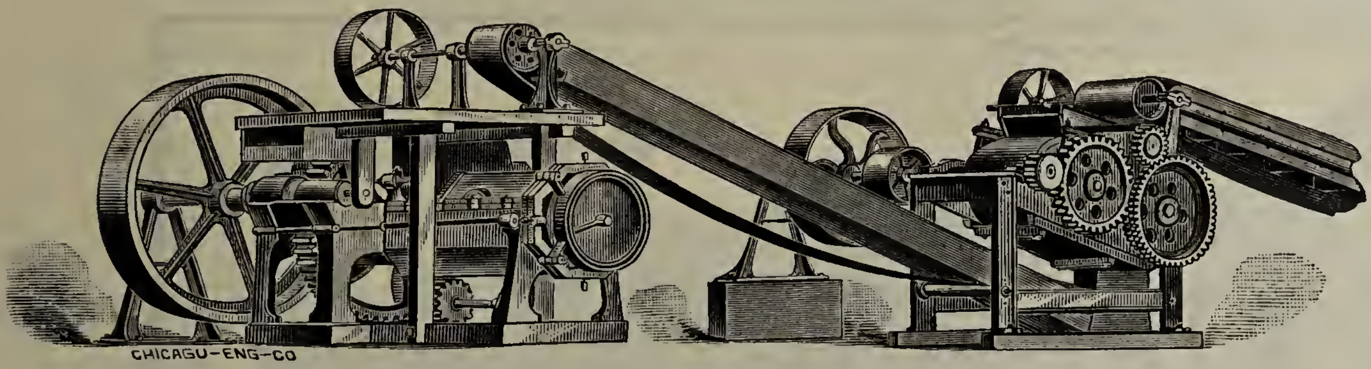
Anderson, Indiana.

[Mention the Clay-Worker.

Adrian Brick and Tile Machine Co., Adrian, Mich.,

—MANUFACTURERS OF—

Brick and Tile Machinery,



Clay Crushers,
Engines
and boilers.

Also Daso's Builders' and Contractors' Elevators. Steam Fittings and Iron and Brass Castings Furnished to Order.

The working qualities of our machinery at its present state of development as estimated by one of the prominent Brick Manufacturing Companies of Kansas City, are stated in the following reply to a letter of inquiry addressed to them:

KANSAS CITY, MO., August 21, 1888.

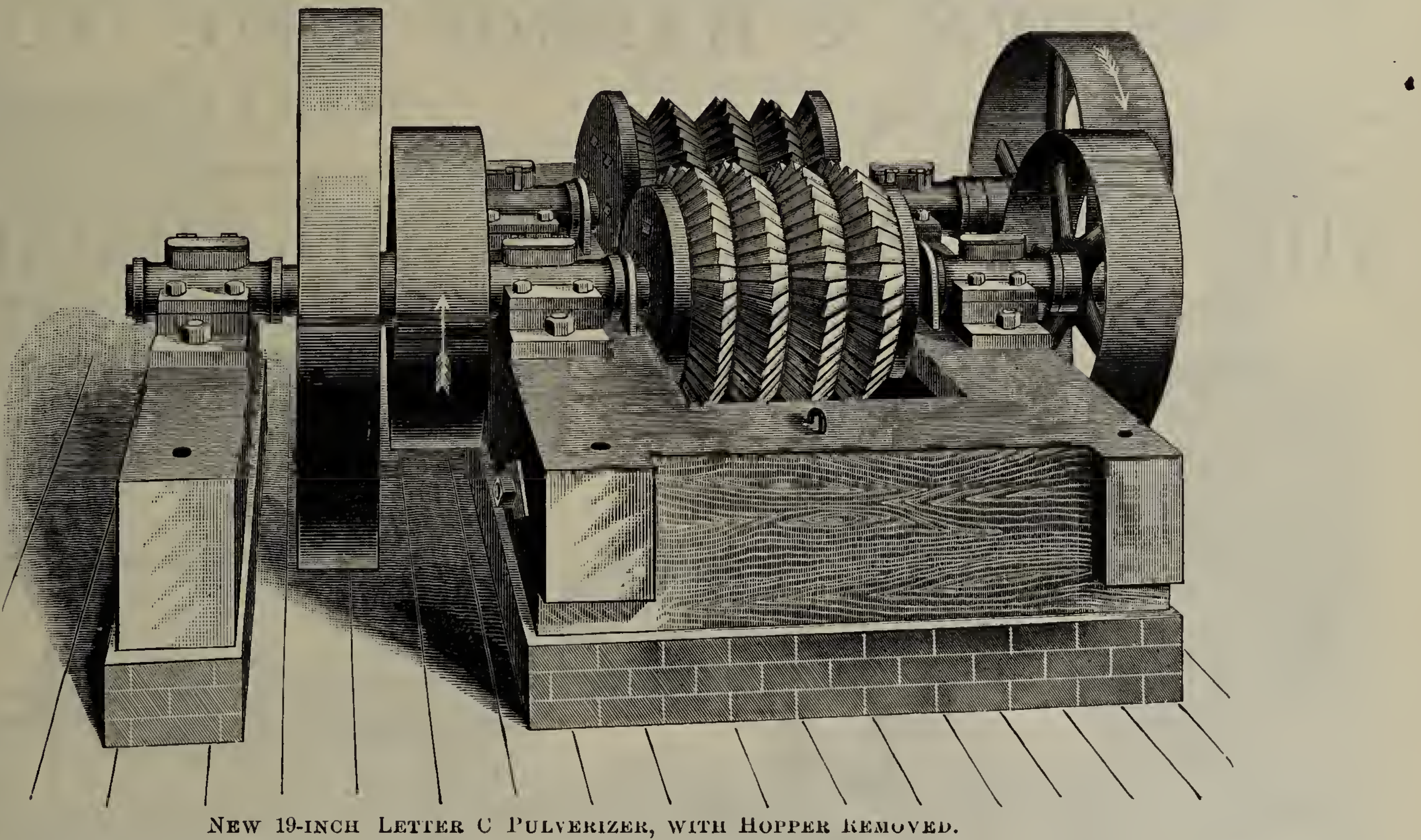
JOHN GIBSON, Esq., Monticello, Iowa:

DEAR SIR—In answer to your favor of the 16th will say, that we do not think there is any room for improvement in the Adrian Brick and Tile Machine Co's No. 4 Cut-off Table, as it cuts the brick as near perfect as possible, without tearing the edges; thus leaving the ends of the brick as perfect as the face. We are also using the new dies on both our machines, and are well pleased with them, as they are 100 per cent. better than the old style and turn out a perfect column of clay without warping or twisting. We have two No. 3 McKenzie machines and they are doing excellent work for us and we averaged during July, 26,800 brick, each, per day. In conclusion we will say that both the new tables and the new dies are so incomparably superior to the old ones that it gives us much pleasure to recommend them.

Very truly yours, SEDDON & EDWARDS BRICK CO.

NEWELL IMPROVED CLAY PULVERIZER

We Guarantee the Material and Workmanship and allow a Trial of our Machine to any Responsible Party.



NEW 19-INCH LETTER C PULVERIZER, WITH HOPPER REMOVED.

Heavy Cold Rolled Shafts running in best Anti-Friction Metal Bearings, protected from dirt.

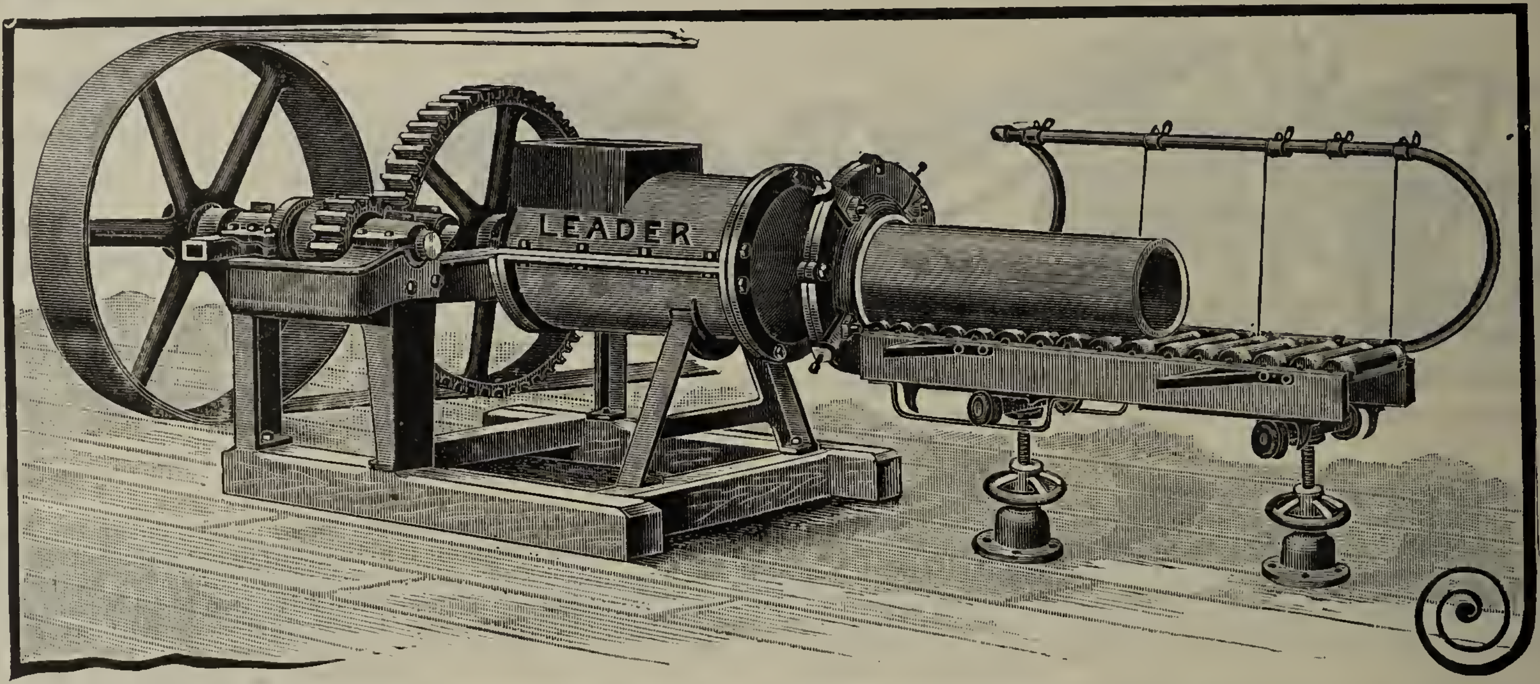
A FEW OF OUR CUSTOMERS AND REFERENCES:

Henry Maurer & Son, (3 Pulverizers) 420 E. 23rd St., New York City.
Peerless Brick Co., Philadelphia, Penn.
Perth Amboy Terra Cotta Co., (2 Pulverizers) Perth Amboy, N. J.
Syracuse Pressed Brick Co., Syracuse, New York.
Potomac Terra Cotta Co., (2 Pulverizers) Washington, D. C.
Siner & Brother, Frankford, Penn.
W. H. Perot, Baltimore, Md.
The Rathbun Co., Deseronto, Ontario, Canada.
Murrill Dobbins, (3 Pulverizers) Philadelphia, Penn.
American Brick & Tile Company, Phillipsburg, New Jersey.

Send for Illustrated Circular and Price List

NEWELL UNIVERSAL MILL CO., - 10 Barclay St., NEW YORK.

THE LEADER BRICK AND TILE MACHINE.



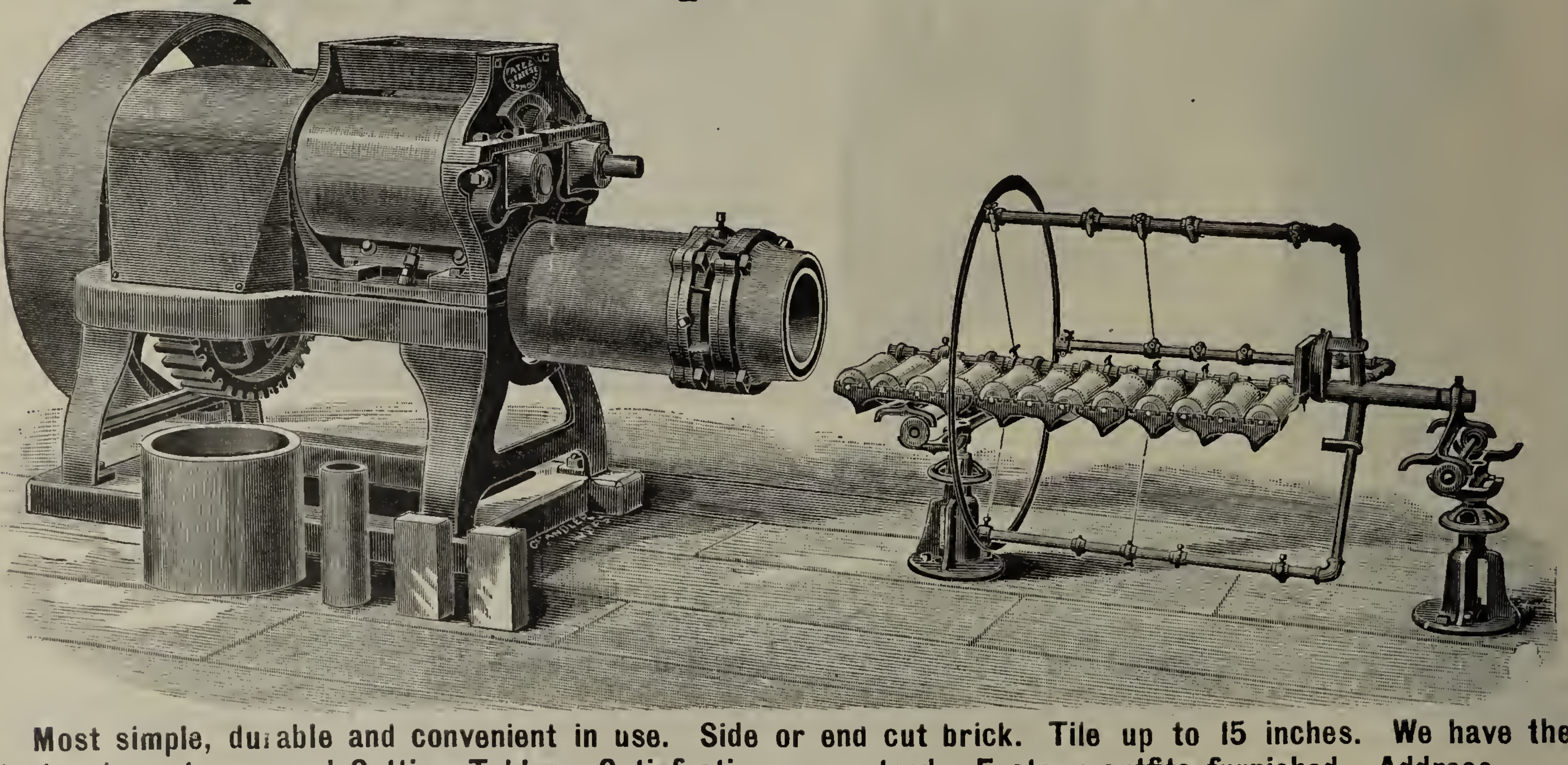
We manufacture the very latest and best designs of Tile Machines, Brick Machines, Clay Crushers, Elevators and Dump Cars for handling clay by steam. Design special clay-working machinery to order. Have a large stock of the best cutting wire. Correspondence solicited.

BROWN & HARROP MFG. CO.,

Geo. S. Pollock, Agent, Sullivan Ind
PORTLAND, IND.

THE OHIO BRICK AND TILE MACHINE.

Unequalled for Rapid and Perfect Work!



Most simple, durable and convenient in use. Side or end cut brick. Tile up to 15 inches. We have the latest and most approved Cutting Tables. Satisfaction guaranteed. Factory outfits furnished. Address

FATE & FREESE,

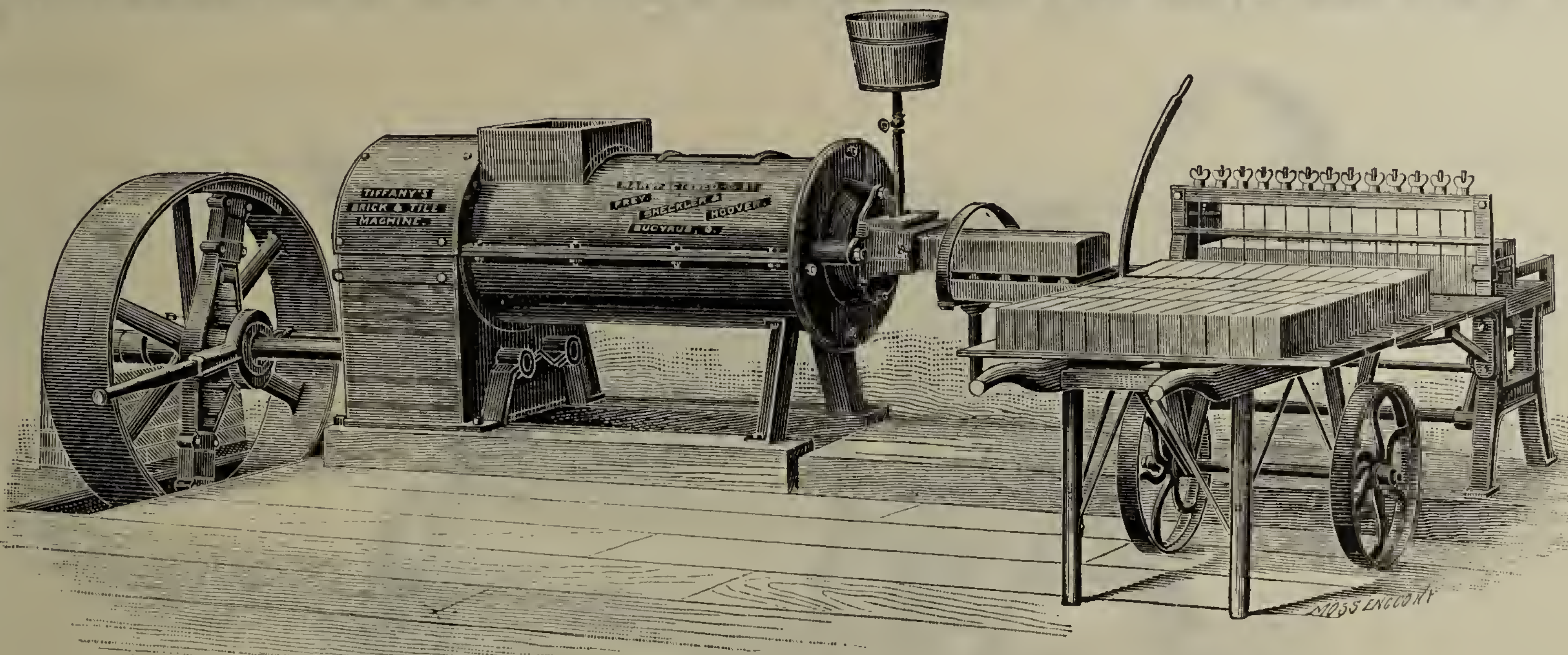
Send for particulars.
PLYMOUTH, OHIO

THE FREY, SHECKLER CO.

BUCYRUS, OHIO

With increased facilities threefold.

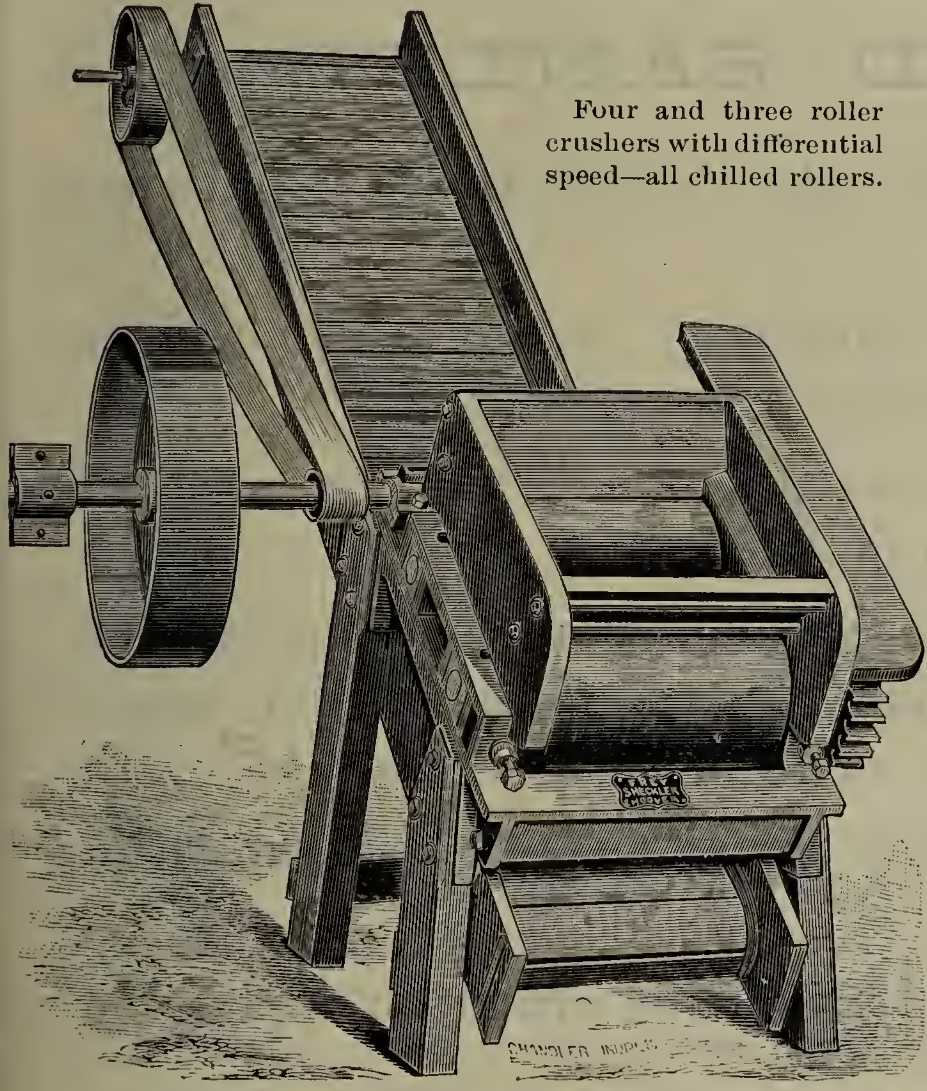
Seven different brick machines. Four different tile machines. Will make any quantity of brick or tile as desired.


TIFFANY'S BRICK & TILE MACHINE.
FREY SHECKLER & HOOVER BUCYRUS O.

The Mascot for light power and low in price.

CUT OF CENTENNIAL WITH SELF-LOADING ATTACHMENT ON CUTTING TABLE.

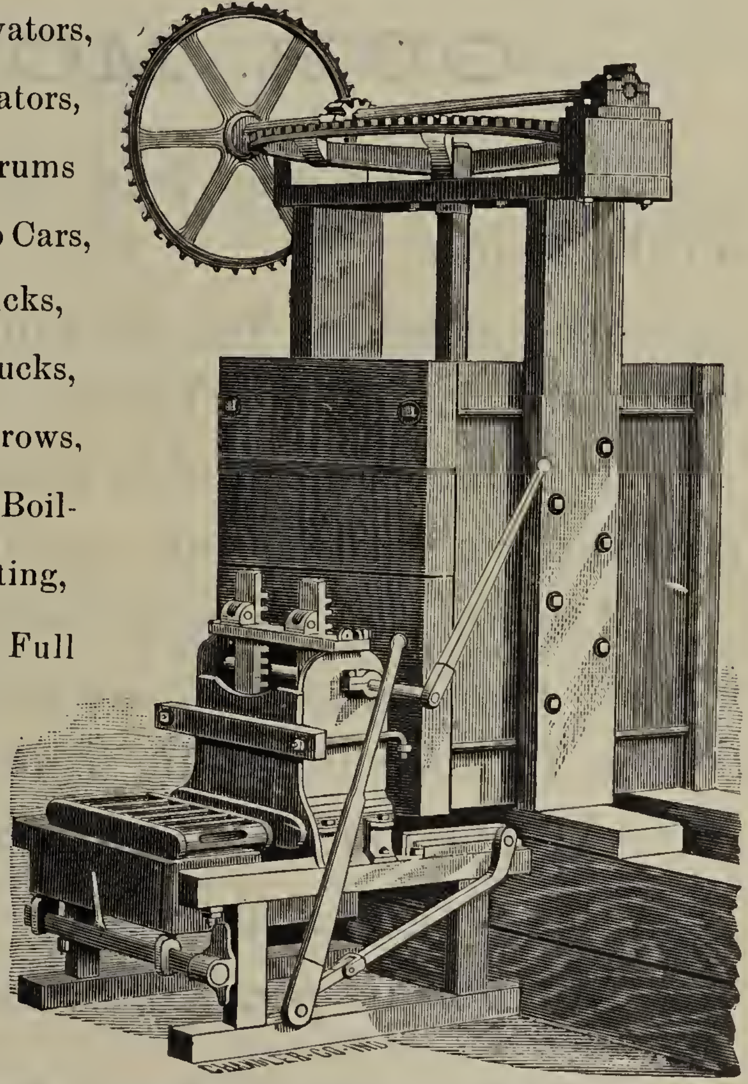
The above cut shows the Board Delivery Cutting Table which loads the brick automatically on special trucks in connection with the Centennial Tiffany Machine and Patent Lubricating Brick Die. Acme Special Brick Machine, largest capacity. The Duplex, 80,000 brick per day.



Four and three roller crushers with differential speed—all chilled rollers.

We make thirteen different patterns of Roller Clay Crushers. All rollers best chilled iron.

Clay Elevators, Tile Elevators, Steam Drums and Dump Cars, Tile Trucks, Brick Trucks, Wheelbarrows, Engines, Boilers, Shafting, Pulleys. Full outfits for Brick and Tile Factories and Fire Clay Works.



The Eagle Brick Machine.

Cheapest and Simplest for Horse and Steam power (16,000 brick per day.)

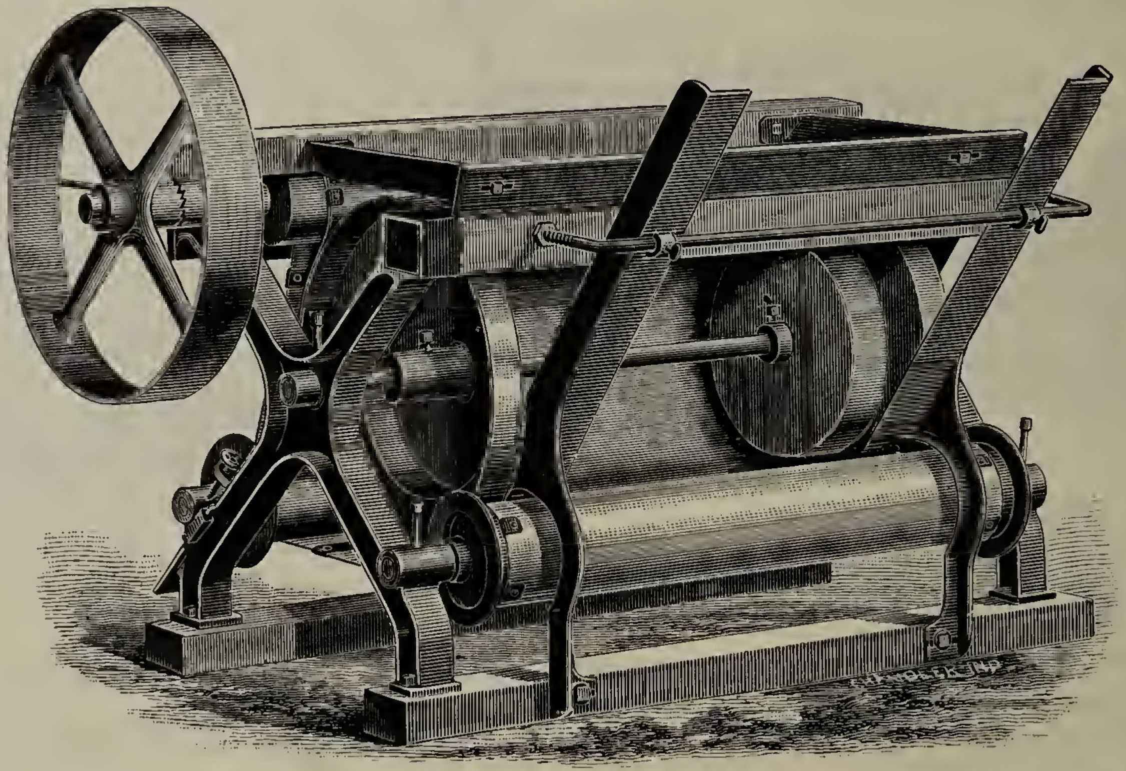
PLANS FOR KILNS FURNISHED CUSTOMERS.

Send for illustrated circulars to

The FREY, SHECKLER CO., Bucyrus, Ohio.

AS USUAL

We are ahead again in Improved Machinery.



OUR MOULD SANDER

Has taken the lead, and is the only Perfect Mould Sander now on the market.

Our machine has no equal for Simplicity in Construction, Durability and Ease and Accuracy with which it does its work.

It sands the moulds perfectly, wastes no sand, and the moulds do not catch in feeding into machine causing delays.

Do not let other manufacturers scare you from using our machine. We do not blame them for getting mad and taking underhand ways of trying to keep the trade from using a machine superior to theirs.

All machines sent on trial and guaranteed to give entire satisfaction.

Prices lower than any.

We will be pleased to mail our Illustrated Circular on application.

C. & A. POTTS & CO.,

INDIANAPOLIS, - - INDIANA.

IMPORTANT to USERS of BRICK MOLD SANDING MACHINES.

TO THE PUBLIC:

Recent attempts by the owners of the Buck Patents on Brick Mold Sanding Machines, to frighten the trade and create a prejudice against the POTTS Machine, by notifying those using it that they are infringing said Buck Patents, require a statement of "the other side of the case." We can state our position in no better way than by publishing the following letters by our Attorneys, to A. H. Newton & Bros., and N. Kessler, of Helena, Montana, (one of the users of our machine who has been notified that it is an infringement on the Buck Patents). Our position is fully and exactly stated therein. The letters are copies, in substance of the originals.

INDIANAPOLIS, IND., April 1, 1889.

A. H. Newton & Bros., Cohoes, N. Y.:

GENTLEMEN:—We address you concerning the controversy with our clients, C. & A. Potts & Co., over the Brick Mold Sanding Machine patents. Through your Attorney you are evidently endeavoring to create a false impression among the trade concerning the Potts' Machine. Besides a letter from him direct to our clients, others have, it seems, been sent to users of the Potts' Machine, to the effect that they are infringing the Buck patents. Such letters have been referred to us for answer, and our answers have doubtless been referred to you by your Attorney. However we are requested to write to you direct to the same purport as to him, in order that there may be no doubt that you have been notified of their position in the matter. The best way to do this will be to quote extracts from our letters to Mr. Stocking. In our letter to him of March 21st, replying to his of March 18th, to our clients, we said:

"We deny that the manufacture and sale of sanding machines under U. S. Patent No. 397,247 is an infringement of either patent to Buck named in your letter, (284,115, and 290,247).

"Our clients being satisfied of their right to operate under their patent, have no terms to offer, favors to ask or concessions to make. Even the statement that your people will proceed 'regardless of all necessary expense,' does not convince our clients that they must surrender rights to which they believe their title is perfect. They expect to stand by their rights all the time and under all circumstances. This is sufficient to enable your clients to see the position of our company. They must proceed as they see fit."

In answer to your Attorney's letter of the 18th of March to Mr. Kessler, of Helena, Montana, we said:

"In regard to this matter, we have only this to add to our letter of the 21st inst. to you, on the same subject: If your clients are anxious to have this controversy settled in Court, we will extend to you any aid possible in getting the questions involved to a speedy issue. If you think you have a good case no reason exists for further delay or attempts to frighten the trade. Our clients are ready to have the issue made immediately. They have information that your clients are also notifying the trade that they have already brought suit against our clients for infringement of the Buck patent. You are notified that they will be held strictly accountable for all such, or any other misrepresentations of fact."

You will see from the foregoing that C. & A. Potts & Co. is quite ready to go ahead with any suit you may see fit to bring, and also propose to make you responsible for all damages to their trade, arising from false reports and misrepresentations of fact circulated by or through you. Our clients are ready to deal honorably and squrely with everybody, and to defend their rights when assailed, to any extent made necessary, cost what it may.

Yours very truly,

C. & E. W. BRADFORD, Attorneys for C. & A. POTTS & Co.

INDIANAPOLIS, IND., March 30, 1889.

N. Kessler, Esq., Helena, Montana:

DEAR SIR:—Our clients, C. & A. Potts Co., of this city, have handed us the letter of the Attorney for A. H. Newton & Bros., which was sent by them by you for answer. They received a letter from the same party and to substantially the same purport, only a few days ago, which they referred to us for answer. A careful investigation shows the claims of the Newtons and their Attorney to be absolutely groundless. The Potts' machine does not infringe the Patents which belong to this company. Our clients are prepared to defend any and all suits brought and are perfectly willing to have the question settled in Court. You will pay no attention to any threats or bluffs from these people, but rest assured that you will be protected in the use of the Potts' machine. If any further movements are made by them inform us, or our clients promptly, and the matter will receive immediate attention.

Yours very truly,

C. & E. W. BRADFORD, Attorneys for C. & A. POTTS & Co.

It will be seen by the foregoing that we propose to stand between the users of our machines and the threatened infringement suits whether the threats mean bluff or business. All users of our machines are requested to inform us promptly of any move of A. H. Newton & Bros. tending to injure our rights or create a prejudice against our machine. We have put our machine on the market only after a careful investigation to ascertain exactly what our rights are in the premises, and, being fully satisfied of our rights, we are prepared to stand by them. Our patent is No. 397,247, of Feb. 5, 1889.

C. & A. POTTS & CO.,

April, 1889.

INDIANAPOLIS, INDIANA.

CLAY DISINTEGRATORS.

OF INTEREST TO EVERY BRICKMAKER.

Appeared in the Clay-Worker, April, 1889.

A WARNING.

Jonathan Creagers' Sons, of Cincinnati, are now manufacturing a Disintegrator which is an infringement on our patents. We hereby give notice that we shall protect said patents, and all persons using these machines are liable for damages.

C. & A. POTTS & CO.

J. & H. M. Creager, Cincinnati, O.:

GENTLEMEN:—On behalf of our clients, C. & A. Potts & Co., of this city, and by their instructions, we hereby notify you that you are infringing their patents on Clay Disintegrators, No. 322,393, No. 368,898, and No. 384,278, and that you must desist or prepare to defend a suit for infringement. Our clients are of the belief that you are already aware of the fact that you are infringing their patents, and that it is a willful infringement. Under such circumstances you must understand that no mercy will be shown in this matter. You must quit and withdraw your machines from the market or take the consequences. Yours very truly,

C. & E. W. BRADFORD, Attorneys for C. & A. POTTS & CO.

OUR REPLY.

JAMES MOORE,

Counselor in Patent Causes.

PIKE'S BUILDING, ROOMS 50 AND 53.

Cincinnati, April 30, 1889.

JONATHAN CREAGER'S SONS,
Gentlemen :

At your request I have examined the C. & A. Potts patents for Disintegrators Nos. 322,393; 368,898; and 384,278; together with your patents, Nos. 380,245 and 385,342, and the Disintegrator manufactured by you, and am of opinion that your Disintegrator does not contain any invention secured by either of the Potts Patents; and, of course does not infringe any of them; and further, even a cursory examination of the State of the Prior Act shows that the sixth claim of their patent No. 322,393, and the first and second claims of their patent No. 368,898, are invalid. I might add, as the result of a quarter of a century of experience in and observation of patent litigation, that when a manufacturer advertises that a rival manufacturer infringes his patents—as the Potts firm does you—in the Clay-Worker for April—and yet does not dare to bring suit for such alleged infringemen, it is very persuasive evidence that such advertiser has no faith in his statements. Indeed such conduct is getting to be quite generally regarded as a mere trick, and not a reputable one either.

JAMES MOORE.

FURTHER, In regard to our alleged infringements of the Potts Patents, we can only say that we are and always have been perfectly willing and ready to have the matter permanently settled, as we do not wish to use any invention that belongs to them; neither do we intend that they shall use any BLUFF or INTIMIDATION to frighten off intending purchasers of our Disintegrators, and we will render all the assistance in our power, toward a speedy settlement of the question, and if in our judgment we can reach a verdict sooner, by waiving our legal right to be sued at Cincinnati, Ohio, and accepting service at Indianapolis, we will do so, and in the mean-time we propose to furnish with each Disintegrator sold, an Indemnity Bond, which will amply protect the purchaser from any damages, that the Messrs. Potts may claim.

Write us for cut and description of our Brick Making Machinery and Disintegrators.

JONATHAN CREAGER'S SONS,

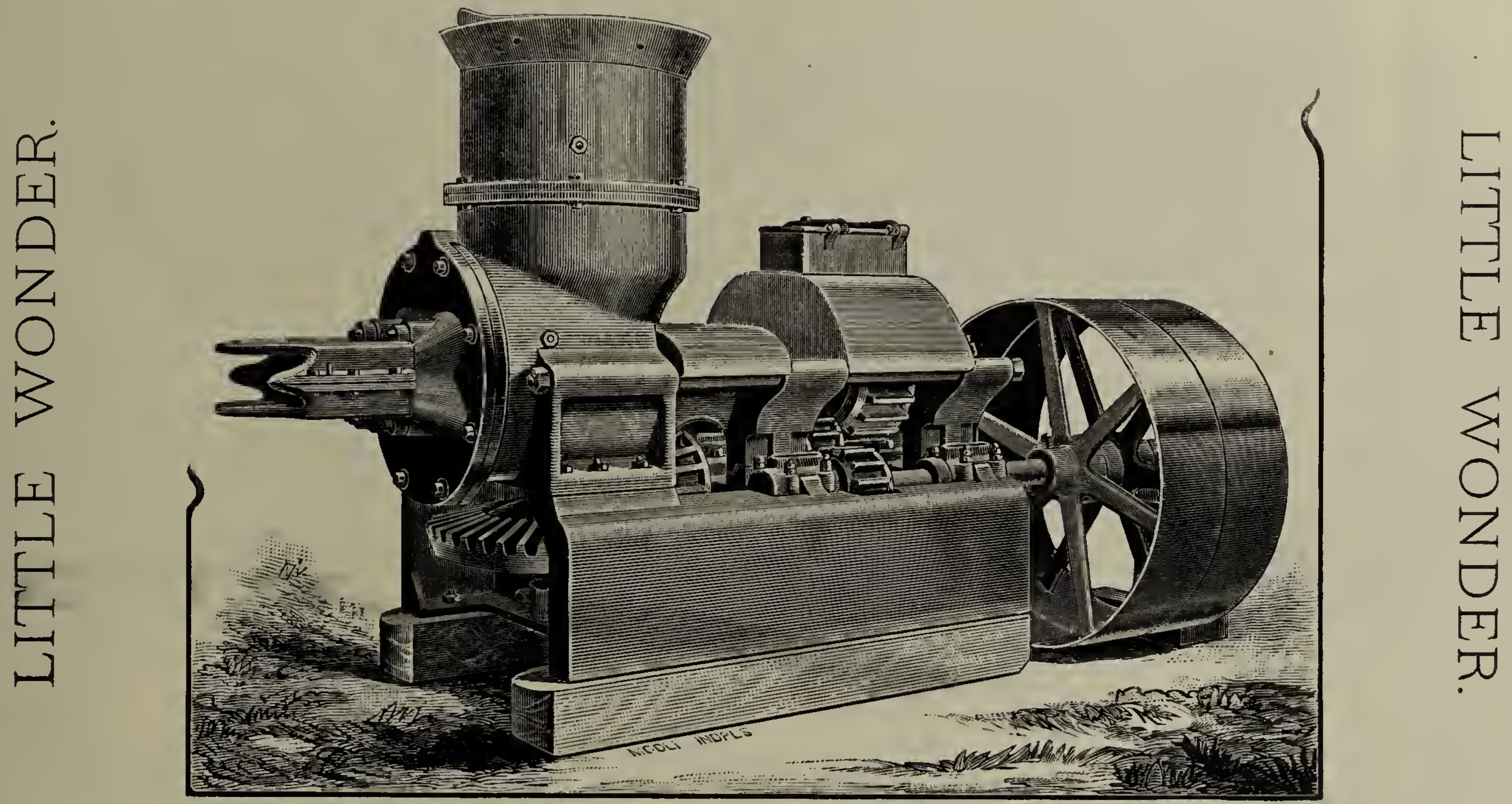
127 West Second St., - - CINCINNATI, OHIO.

☞ **Now equipping some of the first yards of the country.**

The Wallace Manufacturing Company,

FRANKFORT, INDIANA.

In the antique races we may have been beaten but Ben Hur is now holding the reins on a new team—the Little and Big Wonder which we are confident will roll up a good account for any one who will invest their money in them.


LITTLE WONDER.
LITTLE WONDER.

The above cut represents the Little Wonder in its new dress.

The Big Wonder with Automatic Table will appear in the near future.

For full particulars of the Big and Little Wonder, Automatic Table, Clay Crushers and Stone Separators, Pug Mills, Trucks, Iron Cars and other Clay Working Supplies, write to

THE WALLACE MFG. CO.,

FRANKFORT, IND., U. S. A.

[Mention the Clay-Worker.]

A. POTTS & CO.,

INDIANAPOLIS, INDIANA.

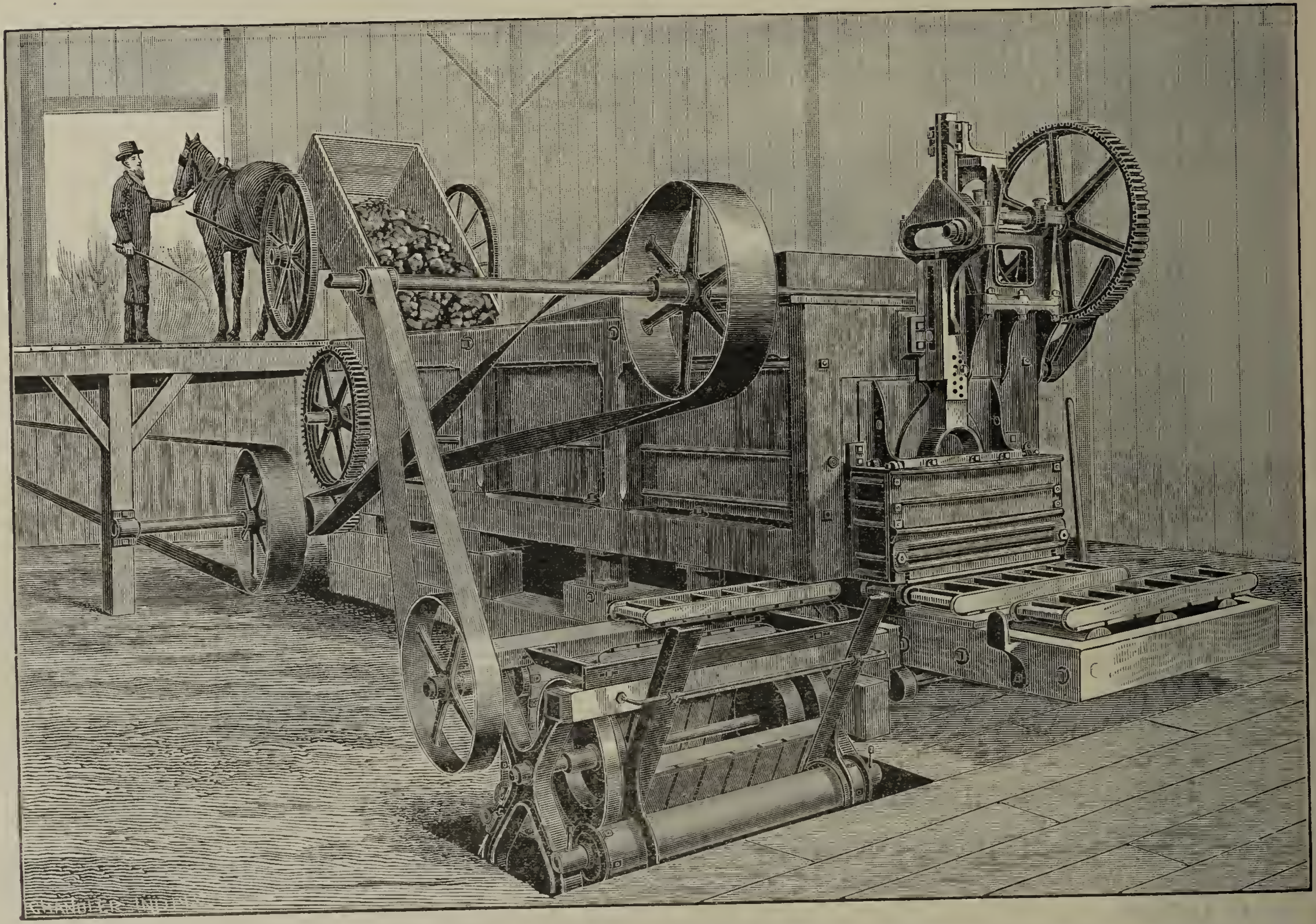
—MANUFACTURERS OF—

BRICK MAKING AND CLAY WORKING MACHINERY,

Including

Sand Mould Brick Machines, Pug Mills for Soft and Stiff Clay,
Mould Sanders, Disintegrators, Elevators, Kiln Castings and Yard Supplies

We are prepared to erect complete plants of any desired capacity.



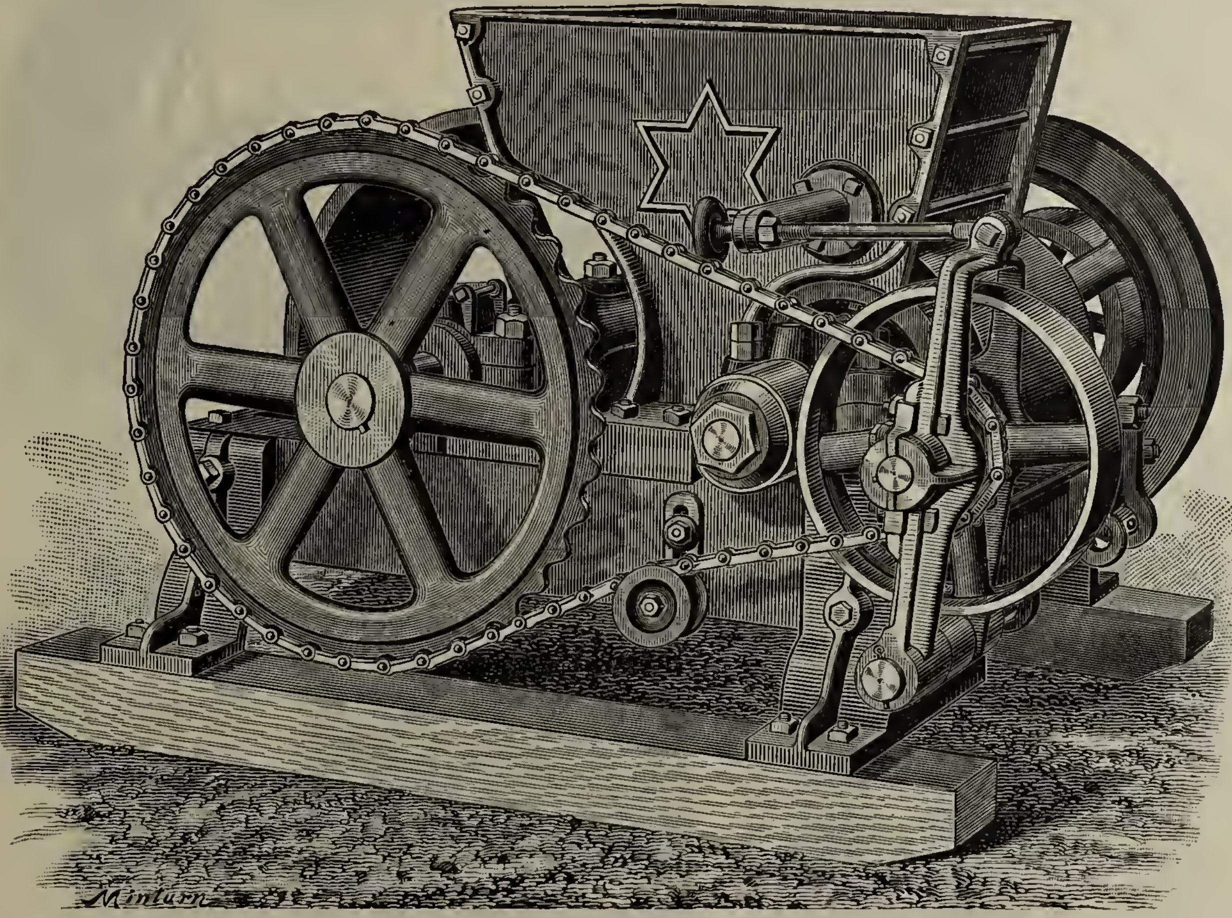
OUR HORIZONTAL STOCK BRICK MACHINE AND MOULD SANDER

Is the best machine on the market for making sand moulded brick.
It is strong and powerful and will work the clay stiff enough to make the finest stock brick.
It works the clay direct from the bank not requiring extra Pug Mills as all vertical machines do.
It has no equal for Strength, Durability, Quantity and Quality of brick made.
It has no light complicated parts underneath machine, all parts being out where they can be kept clean.
Don't fail to write if in need of machinery in our line. Our prices are the lowest.
We shall be pleased to mail our complete descriptive circular.

ADDRESS

A. POTTS & CO., - - Indianapolis, Indiana.

C. & A. POTTS & CO.



Still in the Lead and Without a Rival.

THE POTTS' DISINTEGRATOR has stood the test of seven years, and is acknowledged by all Brickmakers to be the only machine which will prepare clay for brick.

It does not have a patent clod breaker or other complicated machinery, which is liable to break or cause delays.

It will pulverize all lumps or clods, either wet or dry. It will not choke as roller crushers do, everything put in it is ground. It does not require a man to break the clods or stamp the clay as in rollers.

No Brick Manufacturer can afford to be without this machine.

It is invaluable in any Brick Yard where **stony, lumpy,** or **tough** clay is worked.

No more cracked brick.

No more hard dry lumps in brick.

No gear to rattle or break.

No rolls to wear and be replaced each season.

We manufacture a full line of Yard Supplies, Brick Machines, Pug Mills, Elevators, Kiln Castings, Iron Dry Cars, Trucks and Barrows.

C. & A. POTTS & CO.,
INDIANAPOLIS, INDIANA.

[Mention the Clay-Worker.]

A WARNING.

Jonathan Creagers' Sons, of Cincinnati, are now manufacturing a Disintegrator which is an infringement on our patents. We hereby give notice that we shall protect said patents, and all persons using these machines are liable for damages.

C. & A. POTTS & CO.

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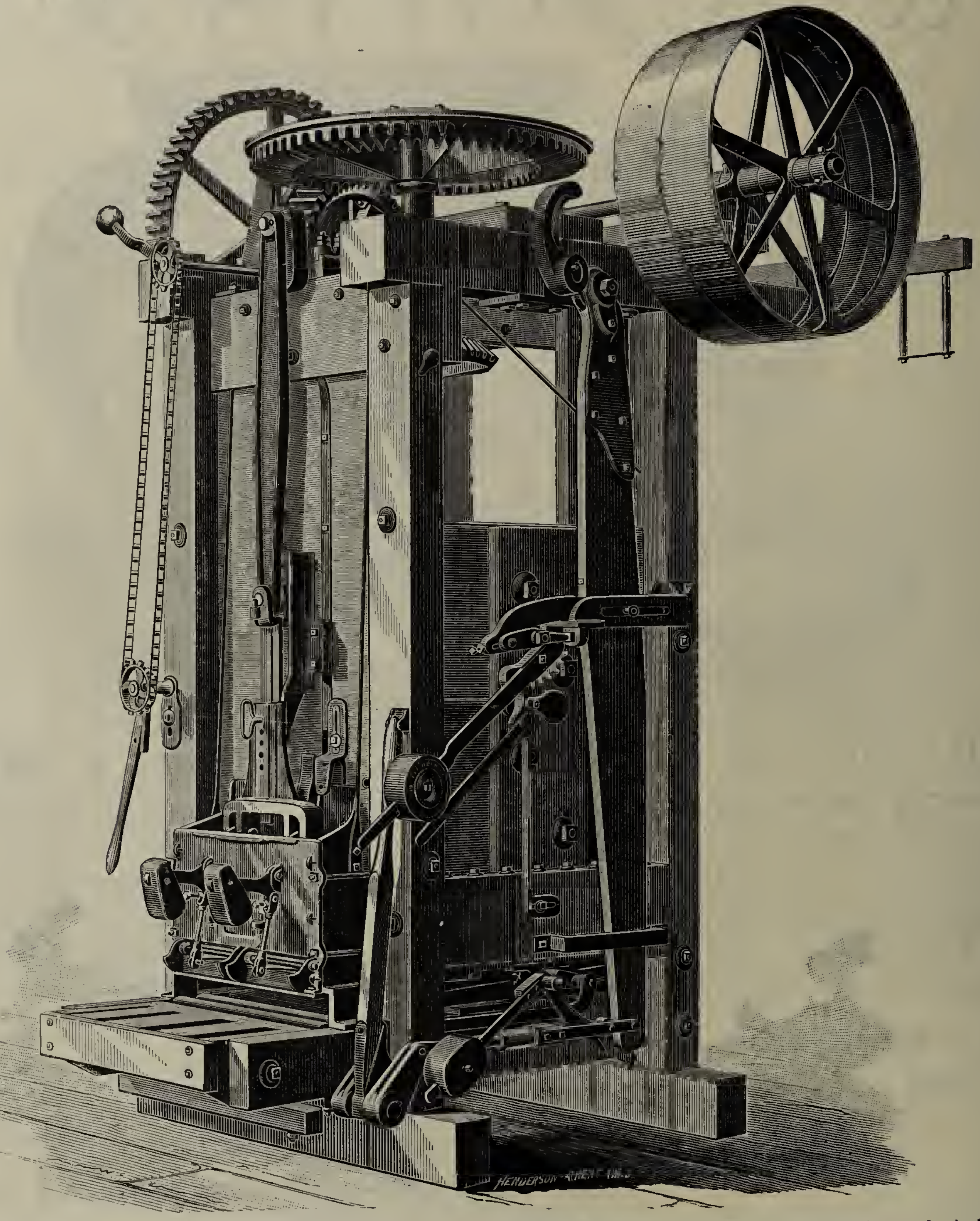
GENTLEMEN:—On behalf of our clients, C. & A. Potts & Co., of this city, and by their instructions, we hereby notify you that you are infringing their patents on Clay Disintegrators, No. 322,393, No. 368,898, and No. 384,278, and that you must desist or prepare to defend a suit for infringement. Our clients are of the belief that you are already aware of the fact that you are infringing their patents, and that it is a willful infringement. Under such circumstances you must understand that no mercy will be shown in this matter. You must quit and withdraw your machines from the market or take the consequences.

Yours very truly,
C. & E. W. BRADFORD, Attorneys for C. & A. POTTS & CO.

The "Tiffin" AUTOMATIC Brick Machine



The "Tiffin" **Automatic** Brick Machine is, **beyond question,** the best machine of its class in the market. It is **Heavy, Strong** and **Durable. IT IS GUARANTEED TO DO GOOD WORK.**

The **"TIFFIN"** is made for use by **Steam,** or **Horse** power. The capacity of the **Horse Power Machine** is 18,000 to 20,000 per day, and of the **Steam Power** 25,000 to 40,000 per day, according to the speed at which they are operated.

Both styles are equipped with our **Automatic "Stone Doors,"** which permits a stone, or any other hard substance, that may have passed in with the clay, to pass out **without breakage to the Machine.**

PRICES:		
	Steam Power Machine	$350.00
	Horse Power Machine	$250.00

The principal shafts are of Steel, and all other material used, is **First Class. Competent Workmen Only Employed** in their construction. These machines have been **Thoroughly Tested** in the hands of **Experienced Brickmakers** during the past season, and with the most **Satisfactory** results to them. Parties who may be **Interested Enough** to wish to make inquiry, will be given the names and address of the parties who have had them in use.

We are the makers of the **CELEBRATED "OLD RELIABLE"** Brick Machine, for use by hand power, which is so well and favorably known to the Brickmakers of the entire country. We are also manufacturers of Turn Tables, Trucks, Wheel Barrows, Molds, Kiln Doors, Etc., Etc. Correspondence solicited.

TIFFIN AGRICULTURAL WORKS,

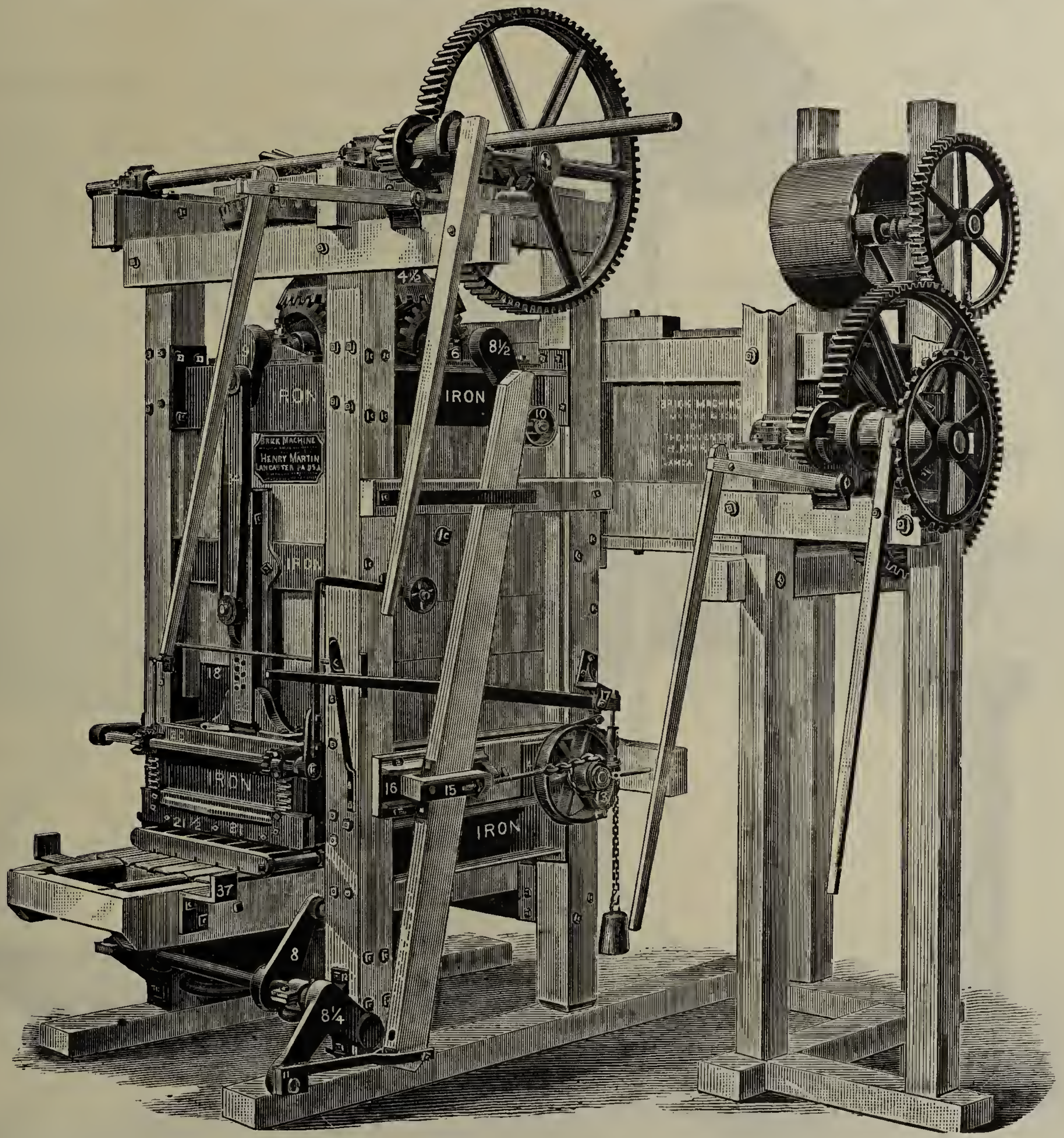
TIFFIN, OHIO.

[Mention the Clay-Worker.]

The Henry Martin Brick Machine.

For Steam or Horse-Power.

FOR STEAM OR HORSE-POWER.



FOR STEAM OR HORSE-POWER.

This cut represents our Steam-Power Machine and Pug Mill combined. It is the strongest. It is the best. It is the most simple. It is the most perfect. It does the best work. It works any clay. It does not get out of order. It is not liable to break down. It stands hard usage. It can be changed to Steam Power.

BETTER THAN EVER.

Our machines are this season the Best ever built by our Mr. Henry Martin, whose thirty years' experience has rendered him familiar with the wants of the Trade.

For Strength, Durability, Qoantity of Output and Quality of Work, they have no equal.

Brickmakers make no mistake when they buy the Henry Martin Machine.

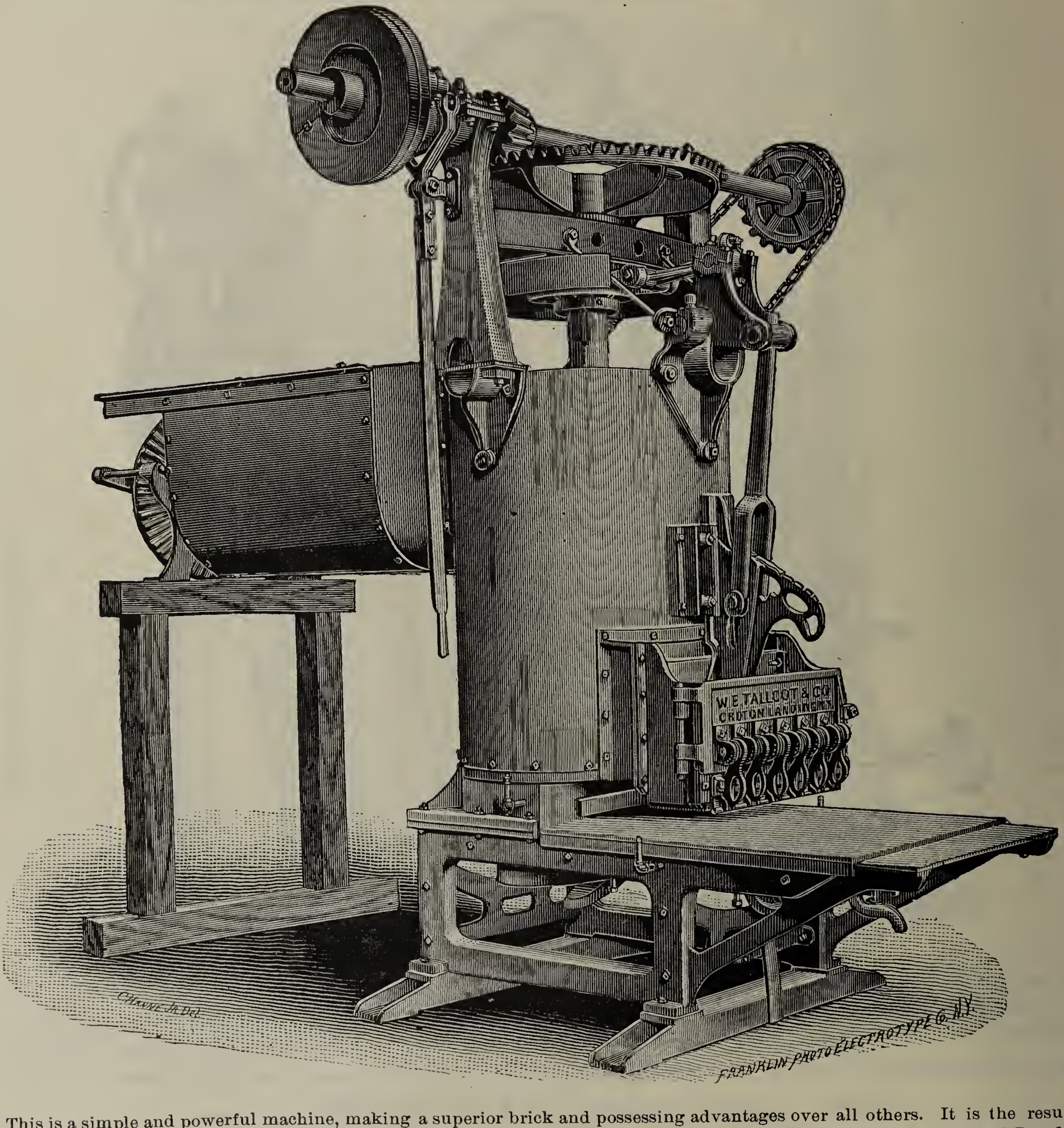
MANUFACTURED BY

The Henry Martin Brick Machine Mfg. Co.,

Send for a Catalogue. LANCASTER, PA., U. S. A.

W. E. TALLCOT & CO'S.

I. X. L. Brick Machine and Improved Pug Mill.


W. E. TALLCOT & CO.
CROTON LANDING N.Y.
CHANNEL Jr. Del.
FRANKLIN PHOTO ELECTROTYPE Co. N.Y.

This is a simple and powerful machine, making a superior brick and possessing advantages over all others. It is the result of years of experience in using and manufacturing brick machines. Among its advantages are *Great Strength, Simplicity and Durability*; few parts, well protected from sand, yet easy of access for adjustment, renewal and repair. No wood is used in its construction; it is made all of iron and steel. Perfect automatic action to prevent breakage by stones or other obstructions. Great tempering capacity and ability to mould very stiff clay. It is easily understood, easily operated, easily kept in order. Quality of brick made, unsurpassed;

The I. X. L. is eipecially designed and built for heavy work. Weight of Machine and Pug Mill 10,000 pounds. Weight of Machine without Pug Mill, 7500 pounds. Send for circular and prices.

It will pay you to use the I. X. L.

W. E. TALLCOT & CO.,

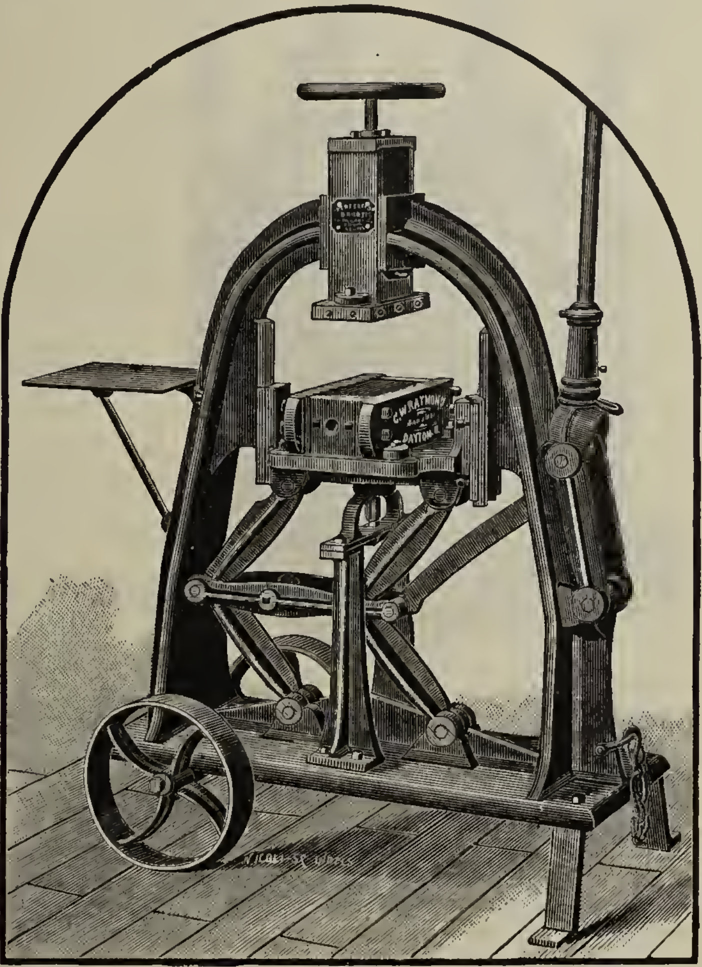
Croton Landing. New York.

RAYMOND'S
PERFECTION BRICK PRESS.

(NO. 1 FOR RED BRICK. NO. 2 FOR FIRE BRICK.)

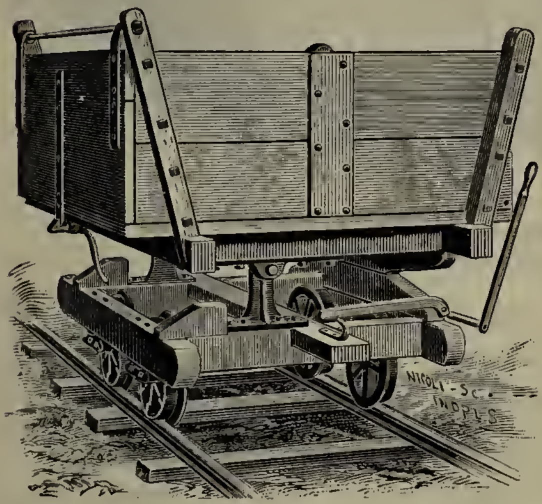
SIMPLE, POWERFUL.

Its whole action is derived from a short, easy, but powerful movement of one lever. A Perfect press which turns out perfect work.



——MANUFACTURERS OF——

AUTOMATIC DUMPING CARS,



For Brick Yards, Gravel Pits, Plantations, Mines, Etc.

SAVES TIME.

SAVES LABOR,

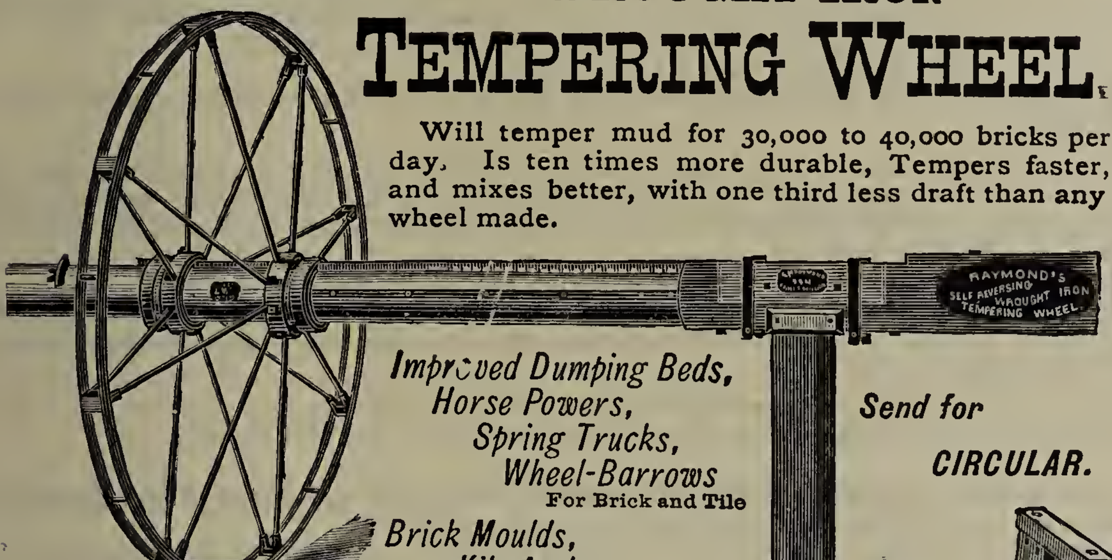
SAVES MONEY.

Write for Illustrated Catalogue giving full description.

RAYMOND'S

WROUGHT IRON
TEMPERING WHEEL.

Will temper mud for 30,000 to 40,000 bricks per day. Is ten times more durable, Tempers faster, and mixes better, with one third less draft than any wheel made.

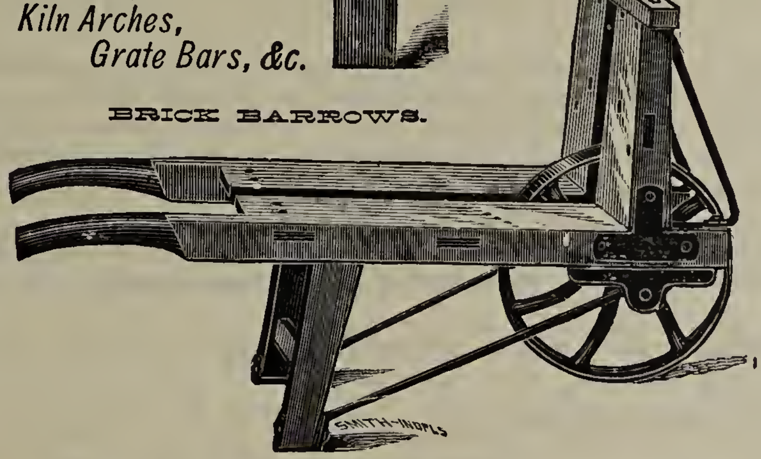

RAYMOND'S SELF REVERSING WROUGHT IRON TEMPERING WHEEL

Pat'd May 18, 1880.

Improved Dumping Beds,
Horse Powers,
Spring Trucks,
Wheel-Barrows For Brick and Tile
Brick Moulds,
Kiln Arches,
Grate Bars, &c.

Send for CIRCULAR.

BRICK BARROWS.



Our Barrows are made from the best of seasoned white-oak, braced in front and cross braces underneath; iron wheel and axle and three coats of paint; the frame is morticed throughout. They will stand the rough usage of the brick yard. For strength and durability they have no equal.

BRICK MACHINE MOLDS.

We manufacture a great number and variety of molds and with improved machinery, we are able to fill orders with dispatch. Our molds are made of the best of cherry wood

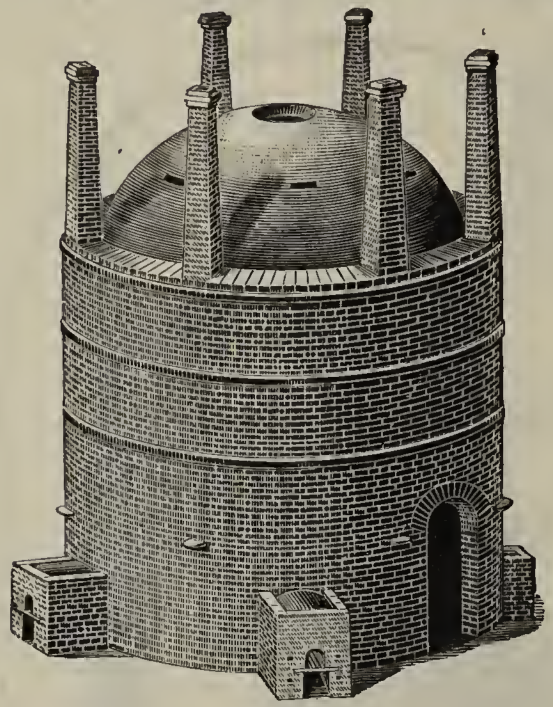
with side pieces gained for partitions and each partition is in turn dove-tailed into the sides. **They are thoroughly iron bound.** The cross-irons being dove-tailed. Without doubt, the most substantial mold made.

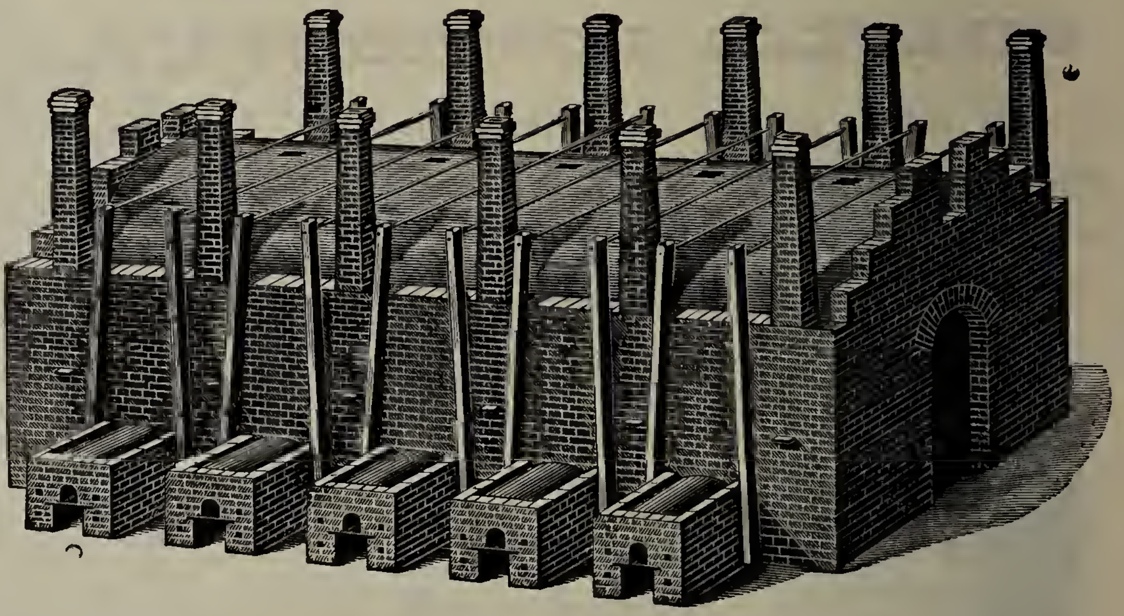
C. W. RAYMOND & CO.,

7 & 11 WAYNE STREET, **(Mention Clay-Worker.)** DAYTON, OHIO.

THE EUDALY KILN.

BURNS ANY KIND OF CLAY OR WARE.





THE DOWN-DRAFT KILN.

UNIFORMITY IN BURNING is without a doubt the most essential feature to clay workers. Especially is this the case with fine clays where it is desired to have the wares of uniform color, size and hardness.

In the construction of these kilns particular attention has been paid to this point, by having first carefully examined the subject of drafts and the strength and nature of the different kinds of fuel. The size of the kiln, the size and number of furnaces, flues and chimneys must always sustain the proper relation to each other for a perfect draft. Too much draft is as dangerous as too little. One of the greatest mistakes of kiln inventors and builders is that they utterly disregard the important subject of drafts.

ABILITY TO DIRECT THE HEAT TO ANY PART OF THE KILN is equally as important as a proper draft. Unless the burner has control of the heat in the kiln he has no assurance of a uniform burn. In these kilns if the burner finds the wares too hot in any portion of the kiln he can in a moment shift the heat to any other part where it is not so hot, or what is better, if he has two or more kinds of wares in the kiln, one of which requires more burning than another, he can easily give that portion of the kiln an extra amount of heat. We claim that this is the only kiln in which these results can be attained successfully.

For this reason wares can be burned by this system **more uniformly** than by any other.

Practically there is no difference from top to bottom, yet this is purely a *down draft* kiln. There are no inside dampers or cut-offs. **Everything about the kiln is permanently built.**

ECONOMY OF FUEL AND LABOR is perhaps the second most important feature of any kiln. We hear a great deal said about "economy in fuel and labor," but to understand what is necessary to a fuel and labor saving kiln one should be thoroughly acquainted with all kinds of fuel and the conditions necessary to get the greatest number of heat units out of it, and at the same time **distribute the heat to the burning wares in the most effective manner.**

We claim that our latest improved furnace is the most **complete economizer** of fuel that has ever been invented.

The construction is purely scientific, and is made by first obtaining the chemical requisites necessary to insure perfect combustion and then building a furnace to bring about these results. Different kinds of fuel require a different size and construction of furnace. We use any kind of fuel, soft coal, screenings, oil, gas or wood.

COST OF CONSTRUCTION.—These kilns require no large stack, which ordinarily costs as much as the kiln proper. Many persons think they must have a large, tall stack in order to have sufficient draft to get the bottom of the kiln burned.

This is certainly a mistaken notion.

The things that are required, however, are a correct location and size of furnaces, flues and chimneys with reference to each other and the kiln. When these are properly attained the burner need have no fear about draft.

In these kilns great care has been taken to adjust these relations in such a way that the expensive stack is not at all required, and a much better draft obtained.

DURABILITY.—Each part of these kilns is built with special reference to strength and durability.

The furnaces, which are perhaps the most perishable parts of any kiln, are in these kilns made very strong and durable.

Those parts most liable to burn out can be easily removed and replaced without damage to the other parts of the furnace.

Rules are given by which a builder of these kilns can get the strongest crown and best supports to the kiln.

SIZES.—These kilns can be built either **round** or **square,** and of **any** desired **size.** A number of these kilns are now in use that burn from **150 to 250** thousand bricks at a time. The walls are built **twenty-four inches thick.** They should be lined throughout with fire-brick where the clay is very hard to burn. Good kilns can be made, however, without using fire-brick for any part except the **furnaces** and **bags.** In asking for cost of construction **state size of kiln in feet wanted,** whether the kiln walls, crown or bottom are any or all to be lined with fire-brick.

DRAWINGS and specifications for building kilns will be furnished any who purchase *kiln or yard rights.* We usually can furnish a man to superintend the building if desired.

For further information address

W. A. EUDALY,

64 Johnston's Building, - - - - CINCINNATI, OHIO.

MORRISON'S
IMPROVED KILN

FOR -:- BURNING -:- CLAY -:- WARES

Especially adapted to Burning Common, Repressed and Ornamental Brick.

PATENTED IN UNITED STATES AND CANADA.

SUCCESSFUL! DURABLE!

Daily product of our Kilns in the United States, One-Half Million Bricks. Our claims fully substantiated BY OUR PATRONS. We claim ninety to ninety-five per cent. hard brick. Arch bricks all Fronts and Pavers and none damaged—of uniform color. Pressed brick burned without fire-marks—coal screenings preferred for fuel. One fireman for two hundred thousand bricks. The

Only Kiln That Regulates the Temperature of Heat

And directs its course by a system of air drafts, giving complete control of the degree of heat, as well as its manipulation. This system we have covered by letters patent. Any persons using these air drafts are liable to prosecution for infringement.

Read the following testimonial from a recent patron, and another new one from an old patron:

Knoxville, Tenn., October 31st, 1888.

R. B. Morrison, & Co., Rome, Ga.:

Gentlemen—I have used your *Improved Kilns* during the past twelve months and cheerfully report the result. We burn our bricks in your Kiln at a cost of sixty-five cents per thousand for fuel and labor; a saving to us, over our old method, of eighty cents per thousand on the two items. My saving in waste brick in the kiln and at the building is fully *ten per cent.*, or sixty cents per thousand in other words Every time I burn your kiln of 300,000 bricks it is a saving to me of *more than four hundred dollars* over the old process. I find your kiln durable and simple to operate. We use coal screenings for fuel. Have no waste in arches, and burn ninety per cent. hard brick. I have no hesitation in pronouncing your kiln a success in every respect, as you make no claims it does not fulfill.

Yours Truly,
REPS. JONES.

Atlanta, Ga., July 20th, 1888.

R. B. Morrison & Co., Rome, Ga.:

Gentlemen—We have used your Improved Kilns for three years and during that time have burned upward of a hundred millions in them and wish to emphasize our former statement in regard to your kilns. They are reliable, durable, and the best kilns for our purpose, we have been able to find after investigating many of the various kilns in use, and say to our friends of the trade: If you want kilns that will burn your brick nearly all hard, and do it every time, burn them economically and without loss, and with little cost for repairs, secure the Morrison Kiln.

CHATTAHOOCHEE BRICK CO., per Geo. W. Parrot, Vice-Pres.

—WE SELL OUR KILN STRICTLY ON MERIT—

☞For descriptive circulars, additional testimonials, and all information desired, address

R B. MORRISON & CO.,

Box 335, - - - - ROME, GEORGIA.

CHAMBERS BROTHERS CO.,

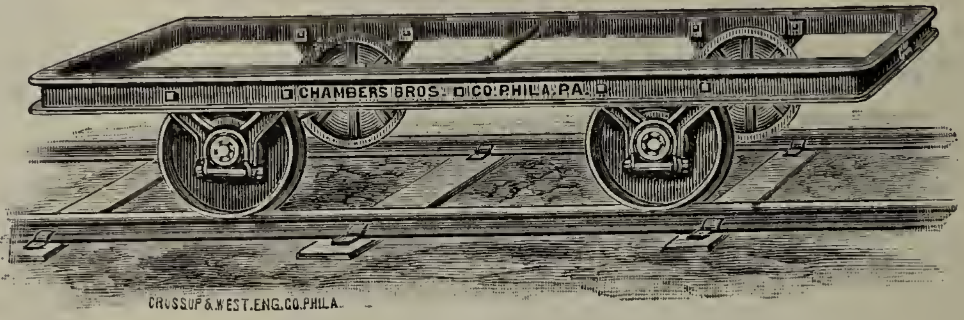
FIFTY-SECOND ST., BELOW LANCASTER AVE,

PHILADELPHIA, PA.

Improved Tunnel Dryers For Common Brick

And the Most Durable and Complete System for Transporting Green Brick.

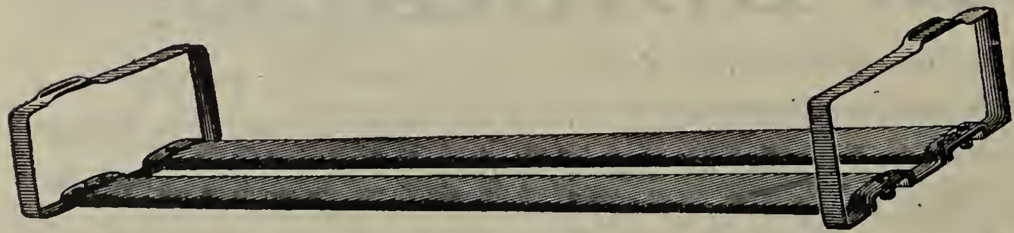
The Strongest Car Made.


CHAMBERS BROS. & CO. PHILA. PA.
CROSSUP & WEST. ENG. CO. PHILA.

The Strongest Car Made.

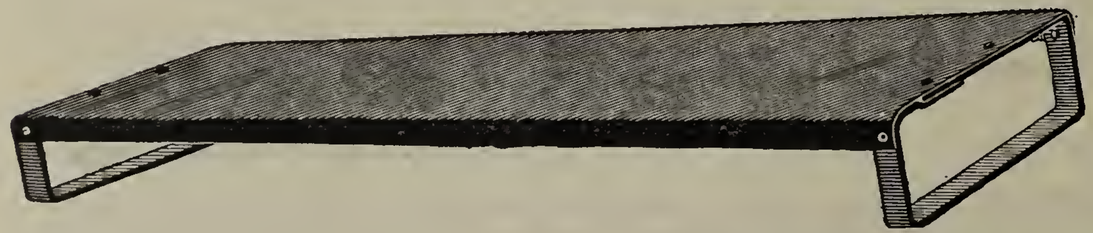
CHAMBERS' WROUGHT-BODY DRYER CAR.

A lower priced Car with cast iron bodies made to order.

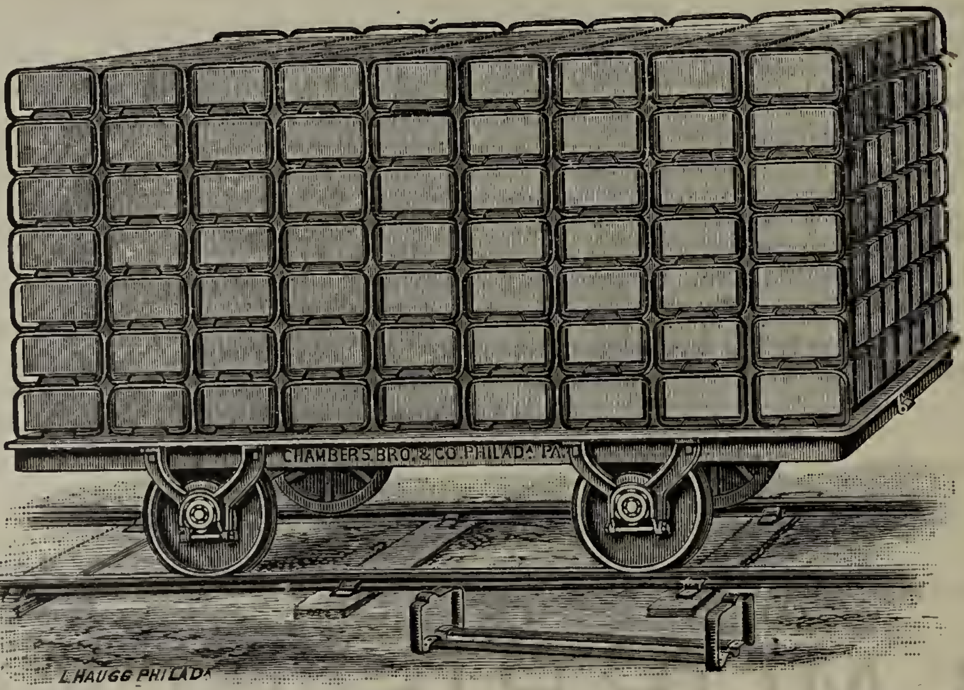


Wrought Iron Interlocking Pallet for Stiff Tempered Brick only.

Steel Pallet for brick placed on flat side or on edge.



Steel Pallet for soft moulded brick, or those placed on flat side only.


CHAMBERS BRO. & CO. PHILADA PA.
L. HAUGG PHILADA

CHAMBERS BROTHERS COMPANY,

PHILADELPHIA, - - PA.

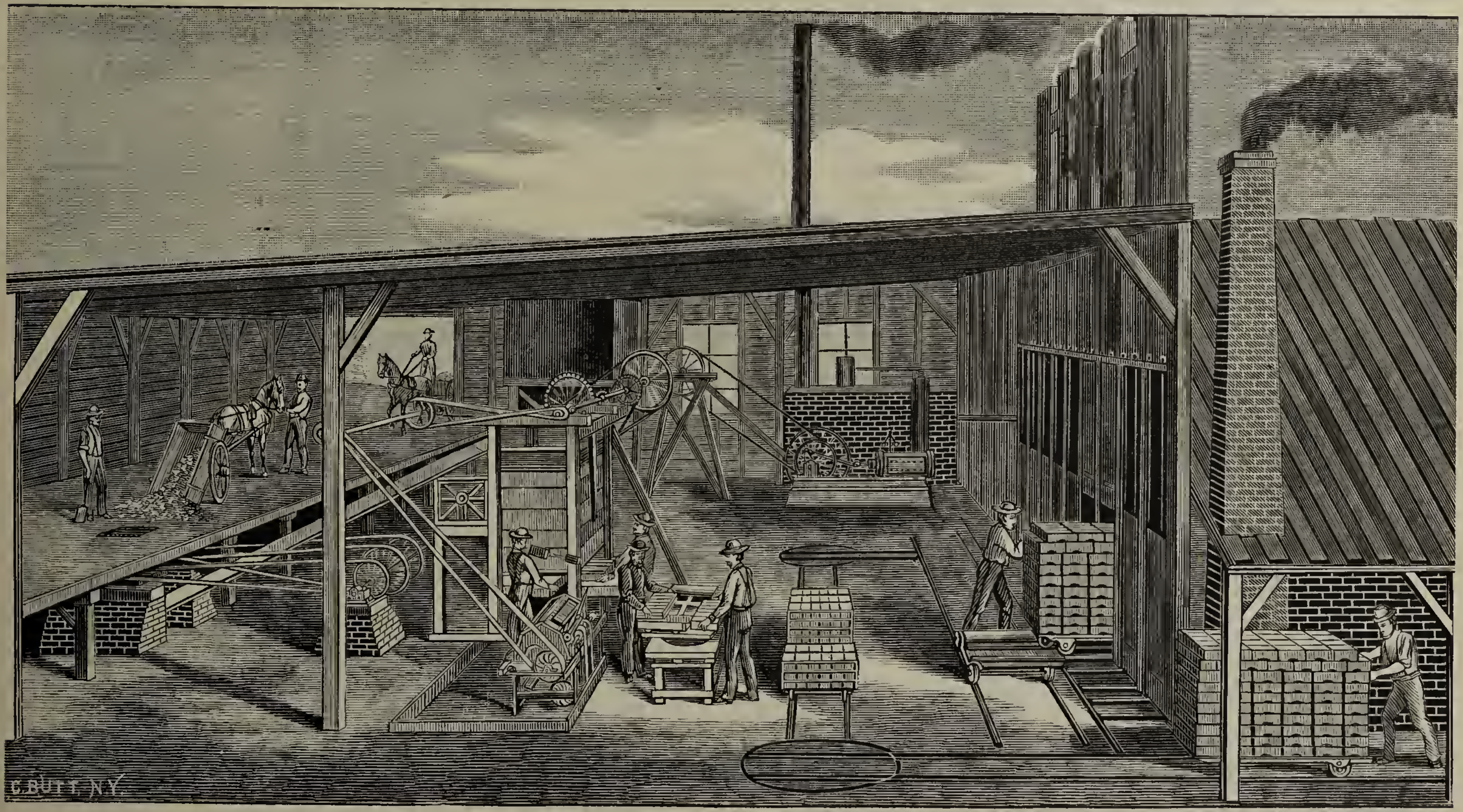
See ad. on front cover page.

[Mention the Clay-Worker.]

SHARER'S IMPROVED DRYER

☞ More than one hundred now in use **DRYING SUCCESSFULLY** Soft Mud Brick, Stiff Mud Brick, Pressed Brick, Fire Brick, Hollow Brick, Tile, Plaster, Architectural Terra Cotta, Terra Cotta Lumber, Peat and Lumber. ☜

No other Dryer in existence can successfully dry such a variety of Materials.



23 are now in process of Construction and under contract to be built this Spring.

The Only Successful Soft Mud Brick Dryer in Existence.

Will also dry Stiff Mud, Semi Dry and Pressed Bricks at 50 per cent. less cost than any Steam Drier.

No other Dryer will Guarantee to dry Soft Mud Brick. I Guarantee to dry any kind of Bricks.

It is not a Direct Heat Dryer, nor a Steam Heat Dryer. It is a Radiated Heat Dryer. The heat being produced from Coal, Wood, Coke, Oil, Gas or any kind of Fuel, and Radiated through Brick or Metal floor. The heat can be so graduated as to successfully dry the most Tender or Refractory Clays without damage. While in a Direct Heat Drier the product of combustion coming directly in contact with the material to be dried will warp, check and crack in most cases. In a Steam Drier the heat cannot be graduated. Neither can heat be produced from Steam near as cheaply as from the Fuel Direct. With a Steam Dryer it is necessary to run one or more Boilers and Exhaust Fans day and night. There is No Machinery whatever necessary to operate my Dryer. Hence the wear and tear and expense of operating is reduced to the minimum.

References and all information given by letter or otherwise. Address,

GEORGE W. SHARER, Proprietor,

134 South Ninth Street,

PHILADELPHIA, PA.

ED. H. CALLAWAY, Gen'l Agt., 72 Redde St., New York.
E. A. KING, Special Agt. New England States, 48 Congress St., Boston, Mass.
HUGH CAMERON, Toronto, Ont., Special Agt. Dominion of Canada.

St. Louis Iron and Machine Works, Iron Founders and Builders of Heavy Machinery.

ESTABLISHED 1854.
INCORPORATED 1875.

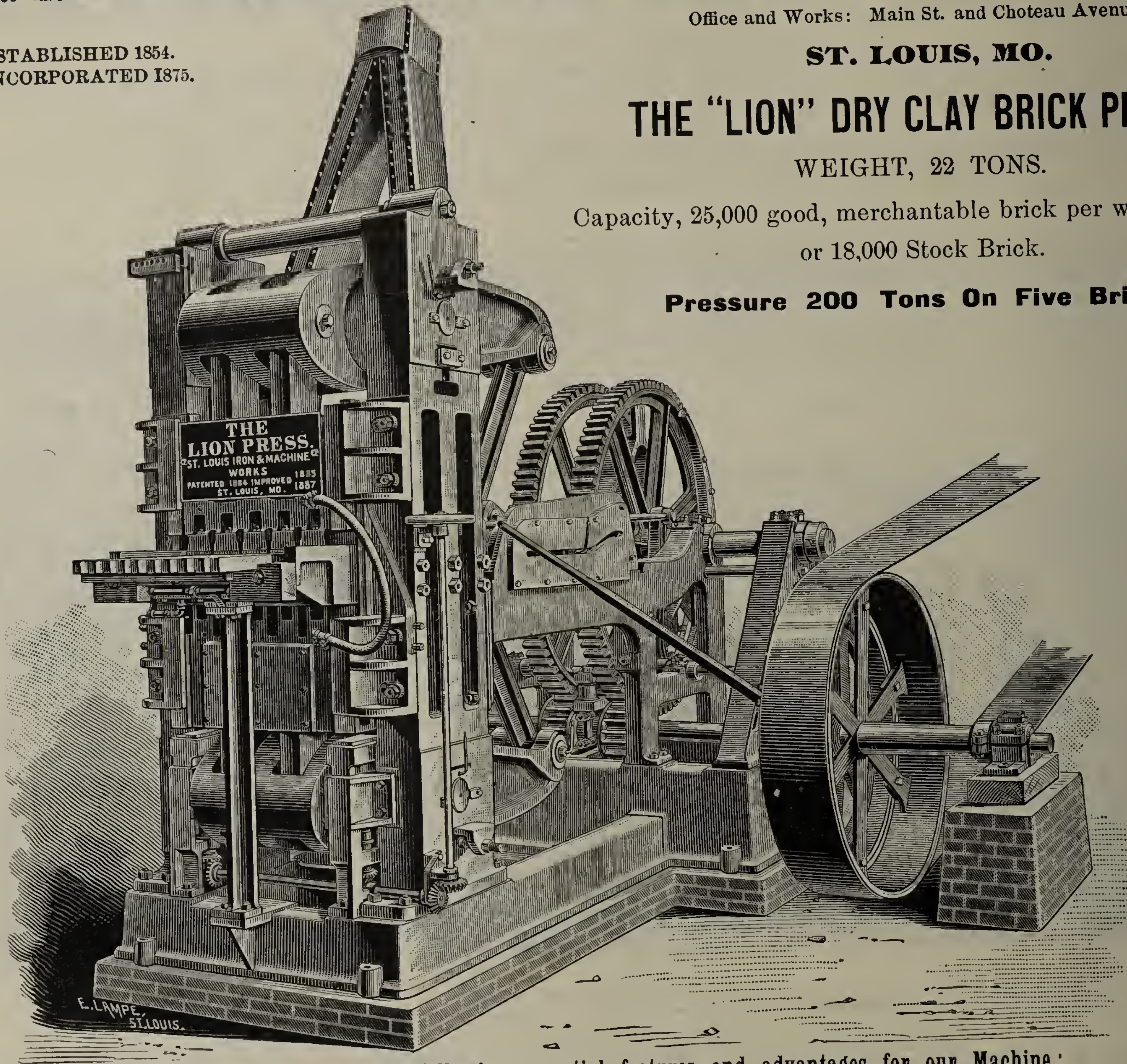
Office and Works: Main St. and Choteau Avenue,
ST. LOUIS, MO.

THE "LION" DRY CLAY BRICK PRESS.

WEIGHT, 22 TONS.

Capacity, 25,000 good, merchantable brick per working day, or 18,000 Stock Brick.

Pressure 200 Tons On Five Bricks.



We claim the following essential features and advantages for our Machine:

1. The main feature of this machine is its great strength, power and durability. The pressure on each brick being 40 tons, and the working parts are so strongly constructed that there is no spring or give under this working strain. 2. The great simplicity and openness of framing and construction, so that every part of the machine is easily accessible for inspection, lubrication and adjustment, thereby reducing the necessary repairs, incidental to every Brick Press, to a minimum. 3. Pressing 5 bricks at each revolution of Machine, keeps the regular force of off-bearers and setters fully employed, which a 4 Brick Machine cannot do. 4. The adjustment of machine from common to stock brick and vice-versa, can be made in a few minutes' time.

Besides the Press, we manufacture and furnish a complete set of clay preparing Machinery, Elevators, Mixers, and Rollers; also Engines and Boilers complete. We also build different kinds of Steamboat Machinery and Stieam Boilers, Corliss Engines, Cotton Compresses, Water Work Plants, Coal and Mineral Mining Machinery, Bridges Work, Hoisting Travelers, Cranes and Elevaters; also general and large castings and Machinery. Any further information cheerfully given.

TESTIMONIALS.

KANSAS CITY, MO., September 28, 1888.

St. Louis Iron and Machine Works, St. Louis, Mo.

GENTS: The two "Lion" Presses I bought from you about two years ago have given me entire satisfaction. As a dry clay press I think they have no superior. I prefer the "Lion" to the "Hydraulic". Ever wishing you success with the "Lion," I am,

Very Truly Yours, DRURY UNDERWOOD.

OFFICE OF
TENNESEE BRICK MANUFACTURING CO.,
NO. 7 MADISON STREET,

MEMPHIS, TENN., September 28, 1888.

St. Louis Iron and Machine Works, St. Louis, Mo.

GENTLEMEN: In reply to yours of 25th inst., we beg to say that our Company contracted with you last spring for one of your "Lion" Brick Machines, having concluded, after our President and Superintendent had thoroughly investigated most of other machines, including the Hydraulic, that yours possessed more advantages and promised better results. In due course the machine was delivereed, set up and put into operation. After having operated it all summer to full capacity, we are more than pleased with results and can heartily recommend the Machine to any one contemplating a purchase. To fully appreciate the merits it must be seen performing work.

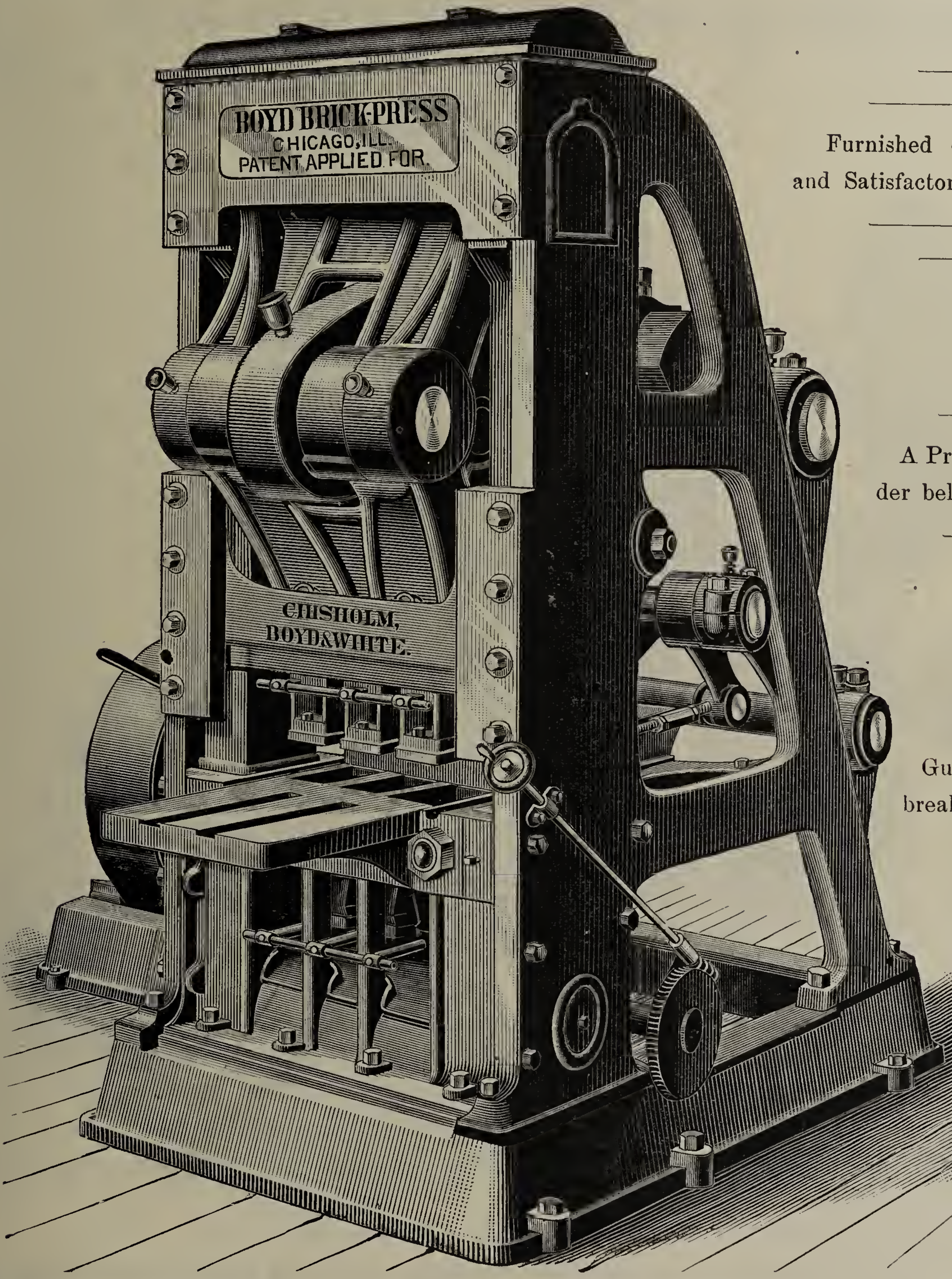
Wishing you that eminent success which you so well merit we remain

Yours Truly, C W. EDMONDS, Sec. and Treas.

A PERFECT MACHINE

WITH

ANY NUMBER OF MOULDS DESIRED.


BOYD BRICK-PRESS
CHICAGO, ILL.
PATENT APPLIED FOR.
CHISHOLM,
BOYD & WHITE.

Furnished on most Liberal and Satisfactory Terms.

A Press is always under belt at our Factory.

Guaranteed against breakage for 2 years

☛ Write or come and see us.

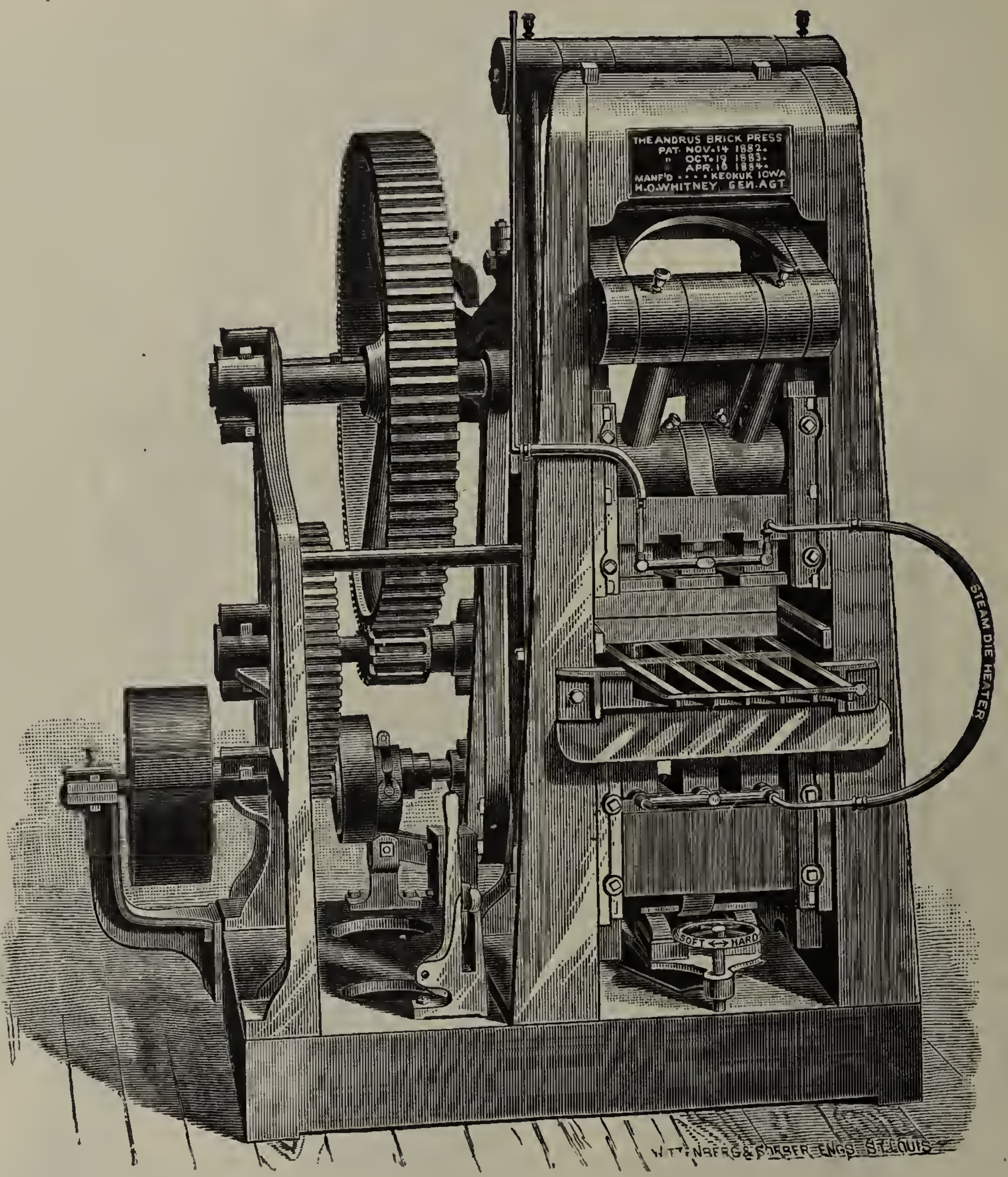
CHISHOLM, BOYD & WHITE,

86 Adams Express Building, CHICAGO, ILL.

THE

Improved Andrus Double Perssure Brick Press.

UNRIVALLED FOR SIMPLICITY, POWER AND DURABILITY.



The Pressed Brick made on the Andrus Machine have been tested by the U. S. Government and adopted for fronts in Government Buildings.

Built at our OWN FACTORY with heavy forged STEEL pressure arms and fully guaranteed against breakage. Not an experiment but a TRIED and PROVEN success.

60 machines in successful operation the past season. Examine it before purchasing.

Ittner Bros., St Louis, Mo., using the Andrus Presses produced 36 large kilns of brick of unsurpassed quality he past summer.

Samuel J. Rose & Son, Chester, Pa., and many others have made a splendid success.

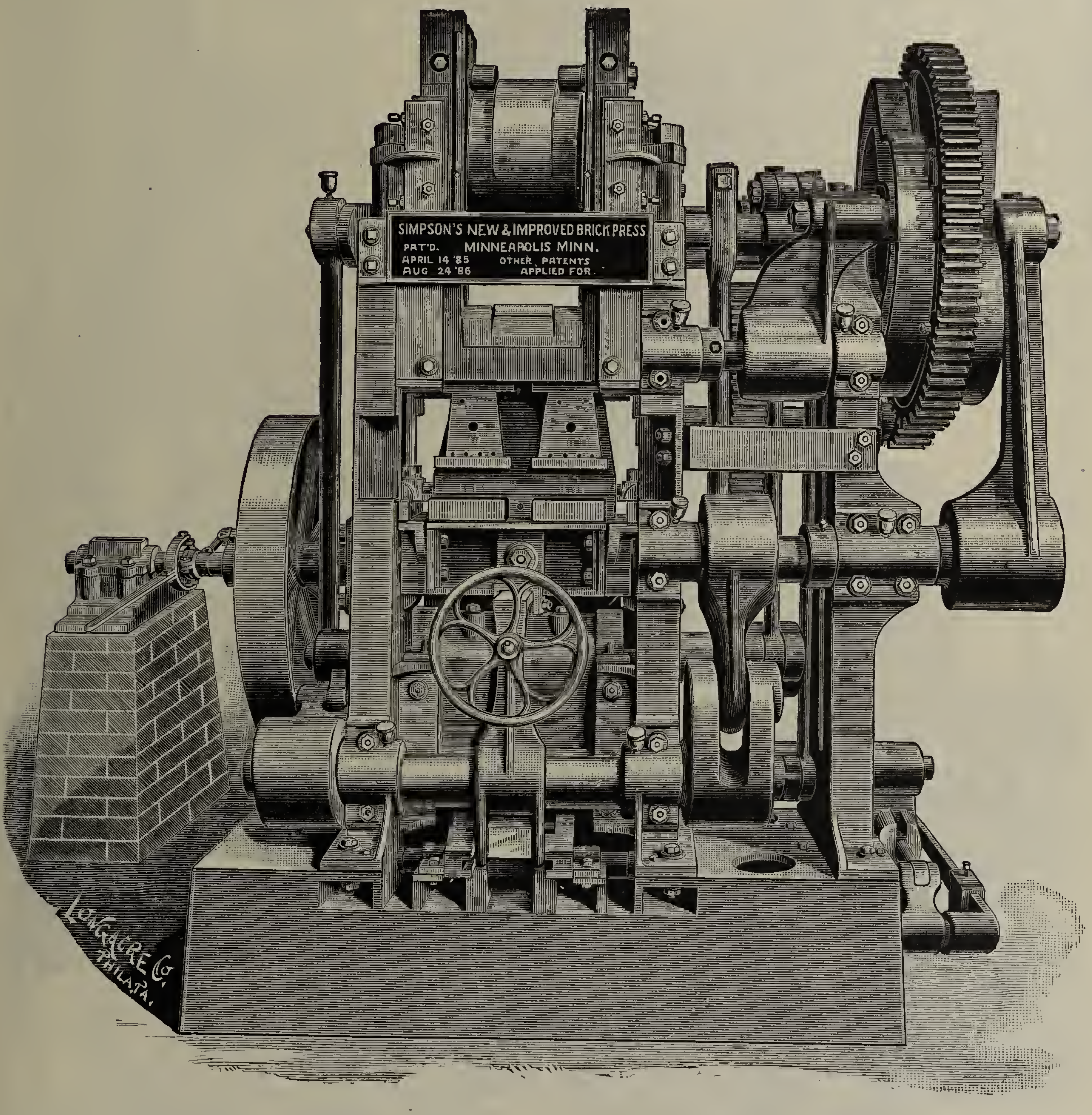
The Andrus Press, Clay Crushers and Pulverizers can be seen in operation at all times at Our Factory.

Send for descriptive circular and reference, address

H. O. WHITNEY, Gen'l Agent,

General Office and Factory, KEOKUK, IA. (Mention the Clay-Worker.) KEOKUK, IOWA.

SIMPSON'S NEW
AND
IMPROVED BRICK PRESS.


SIMPSON'S NEW & IMPROVED BRICK PRESS
PAT'D. MINNEAPOLIS MINN.
APRIL 14 '85 OTHER PATENTS
AUG 24 '86 APPLIED FOR.
LONGACRE Co.
PHILA, PA.

Send for particulars and prices

SIMPSON BRICK PRESS CO.,

44 Tribune Building, **MINNEAPOLIS, MINN.**

Improved Eureka Dry Press Brick Machine.

WEIGHT SEVENTEEN TONS.

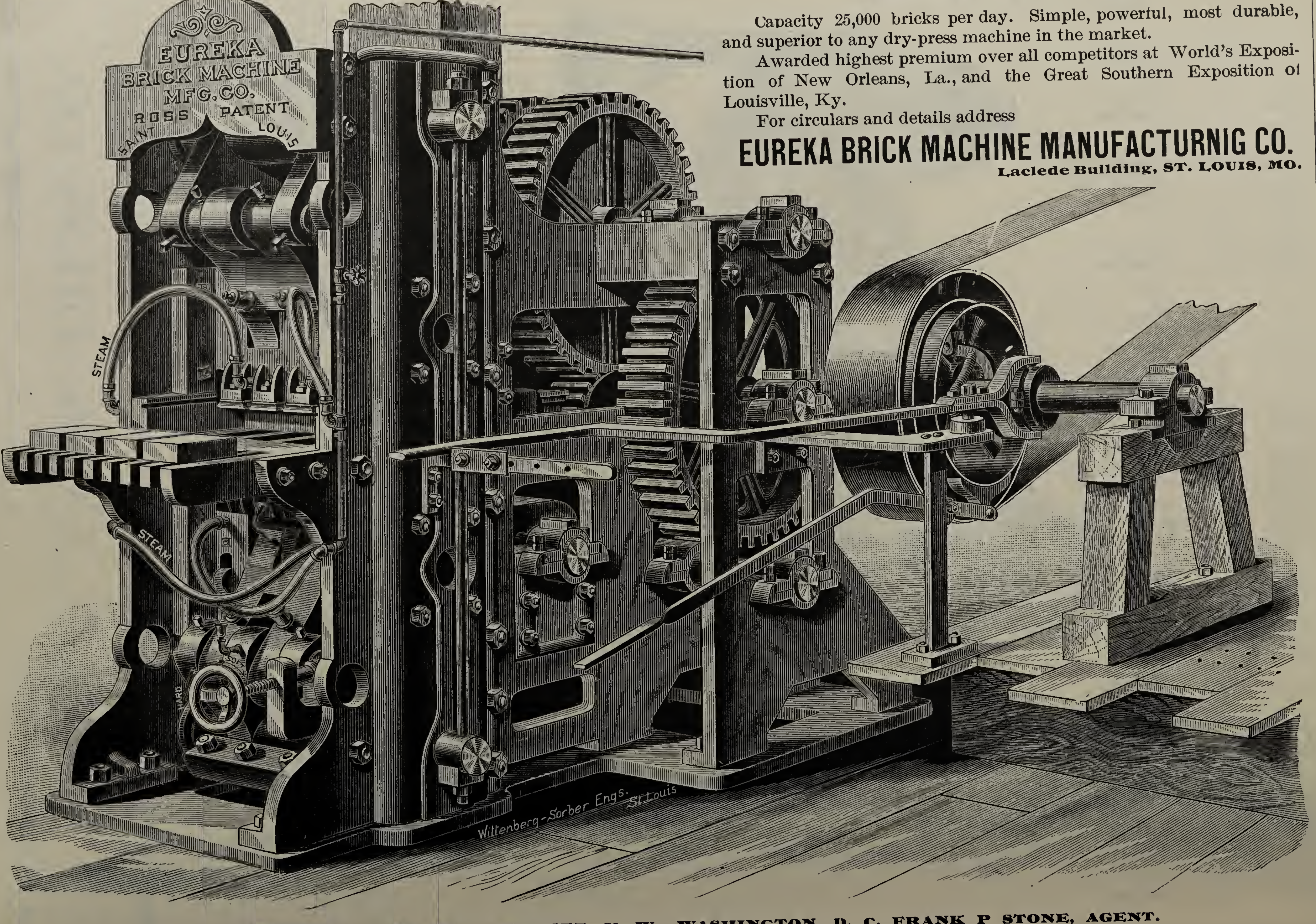
Capacity 25,000 bricks per day. Simple, powerful, most durable, and superior to any dry-press machine in the market.

Awarded highest premium over all competitors at World's Exposition of New Orleans, La., and the Great Southern Exposition of Louisville, Ky.

For circulars and details address

EUREKA BRICK MACHINE MANUFACTURNIG CO.

Laclede Building, ST. LOUIS, MO.



EASTERN AGENCY, 1321 F STREET, N. W., WASHINGTON, D. C. FRANK P STONE, AGENT.

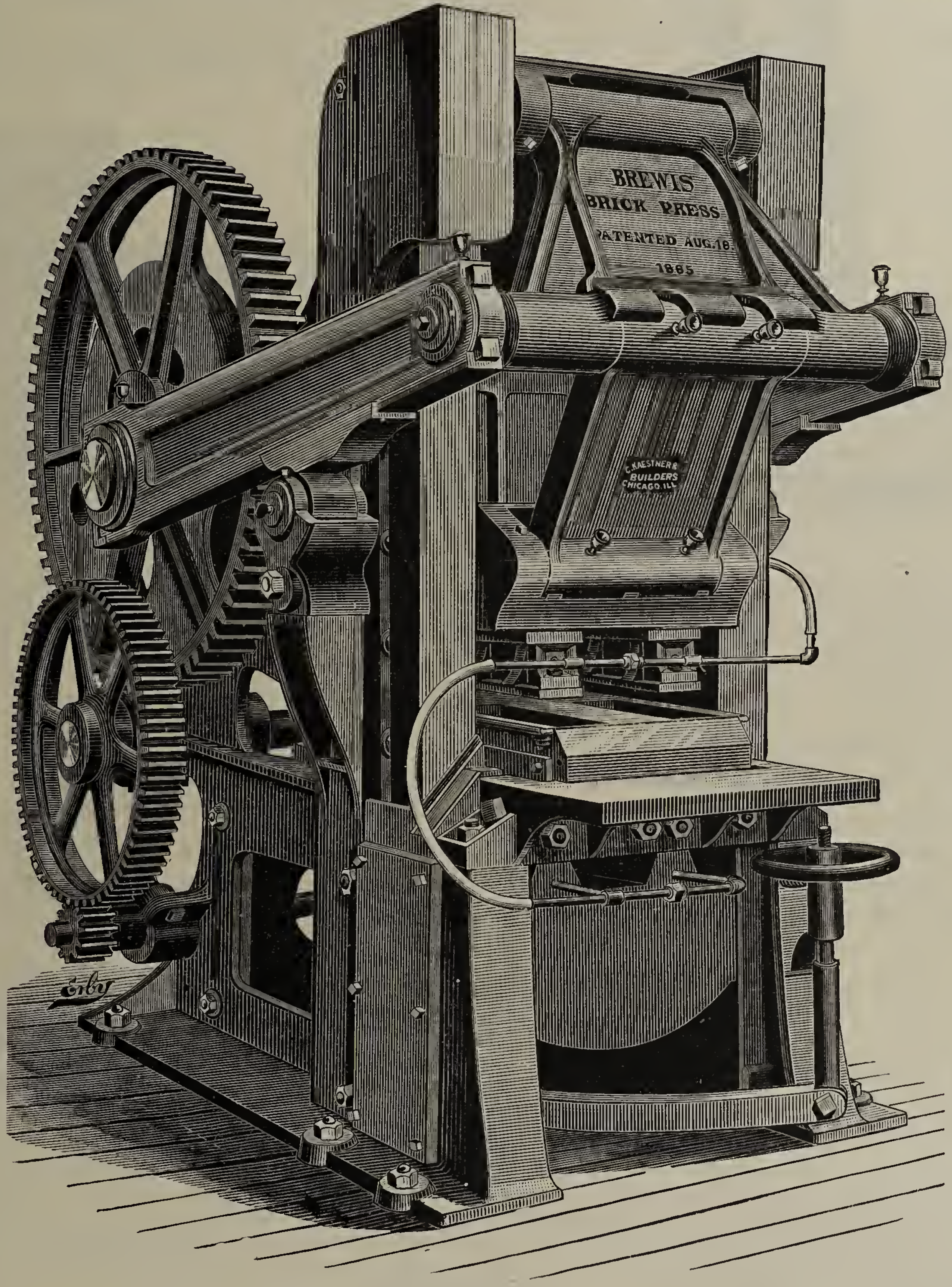
The Brewis Patented Brick Press.

SIMPLE AND DURABLE.

Guaranteed to make as many Perfect Brick per mould as can be made on any machine now in the market. We except none.

Fully covered by patents. **We protect our purchasers.**

Capacity 8,000 to 16,000 a day depending upon the clay



Shipped to responsible parties on 30 to 60 days trial.

Guaranteed against breakage for Two Years.

We furnish the Boyd and Raymond Pulverizers at prices that defy competition. Send for Circulars and Prices to

CHARLES KAESTNER & CO., Machinists and Founders,

ENGINES, BOILERS, PUMPS, SHAFTING, PULLEYS, HANGERS, ETC.,

[Mention the Clay-Worker.] **303-311 South Canal Street, CHICAGO, ILL.**

I. & M. WOLFF & COLEMAN

THE "IRON CLAD"

STEAM DRIER.

Automatic,

Simple,

Efficient.

Features Radically Different from any other Drier.

Is Broadly Secured by Bona Fide Patents.

Buildings Not Expensive to Construct.

Patentees and Sole Builders

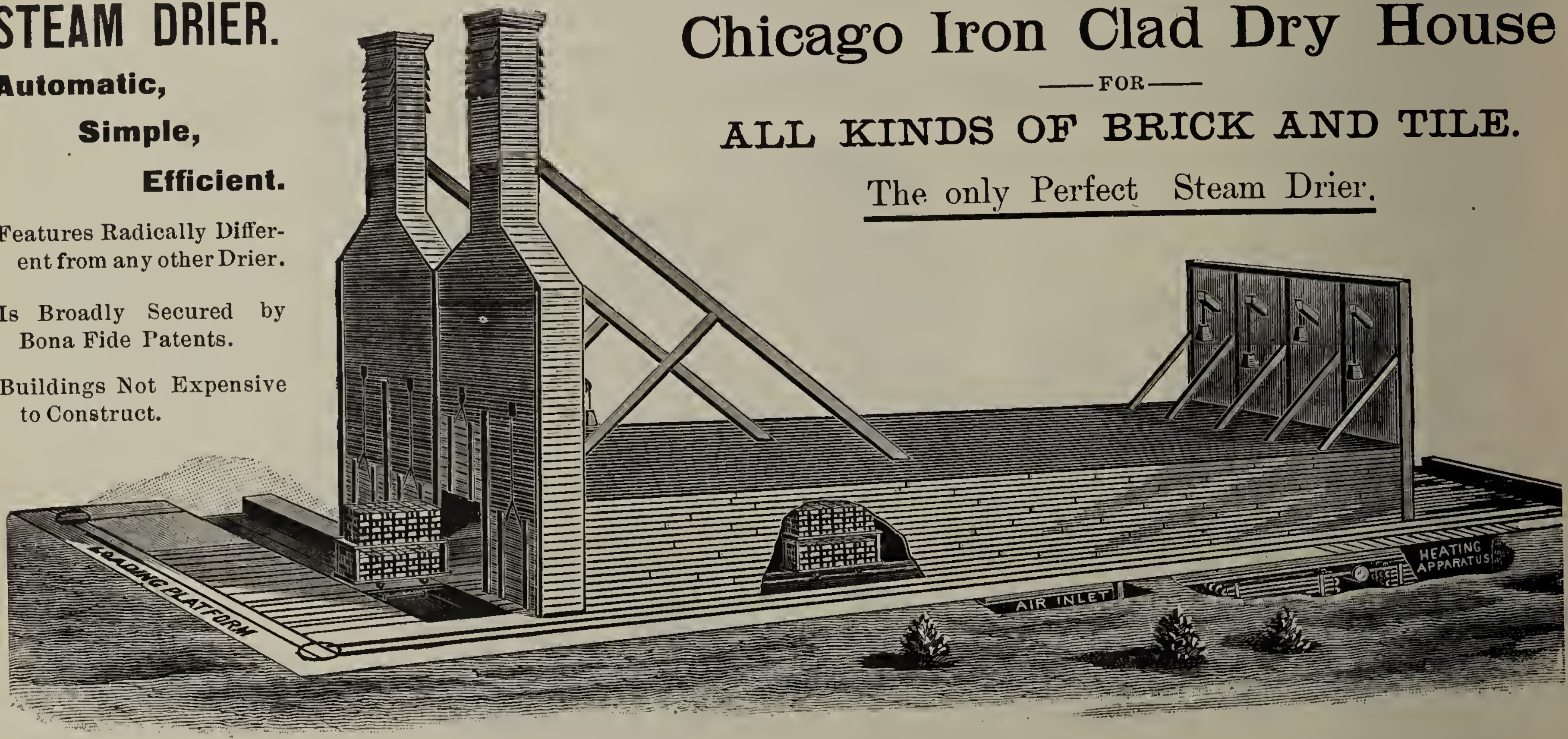
—OF THE—

Chicago Iron Clad Dry House

—FOR—

ALL KINDS OF BRICK AND TILE.

The only Perfect Steam Drier.



This Dry House is a combination of the Drying Floor and Tunnel System. The radiation from the Iron Floor extending over the heating coils dries the lower tiers of bricks. The perforation of the Iron Floor gives an even distribution of the heat and prevents cracking. The steam heat is not so intense as to melt down the bricks or bake them. The bricks are dried uniformly; they come out smoothly and burn evenly, with a good ring. The water-smoke is drawn off rapidly as made and the drying is even and gradual. Stiff mud bricks are haked on double deck cars and thoroughly dried in 24 hours. Soft mud bricks are dumped on pallets and cars carry the same through Dryer in 24 hours. Semi-dry and dry pressed bricks are specially provided for and can be dried without injury. We can convert other Dryers into our system, thereby improving product and capacity. Our buildings are constructed entirely of wood; are simple, cheap and easily erected. We furnish complete steam heating apparatus with pipes and connections, Iron Cars, Turn-tables, Transfer Cars, Rail and superintendence. Confer with us before contracting elsewhere. We will save you money time and trouble. State character of bricks made, name of machine used and capacity required.

CORNING, N. Y., February 11, 1889.

Messrs. I. & M. Wolff and Coleman,
102 *W. Washington Street, Chicago, Ills.:*

GENTLEMEN—Your Mr. W. C. Byrne arrived here one week ago to see how the Dryer which you people put in for us was doing its work. A part of the time that he has been here the mercury has been 10 degrees below zero and the brick has dried as well as in midsummer. The Dryer, size 28x76, is doing all that you claim for it and we are sure if your directions are properly carried out it will dry more than 20,000 brick per 24 hours. Before we purchased this Dryer from you we visited several places where the hot air Dryers are in use and had partially decided to put in one of them; but seeing your Chicago Iron Clad Steam Dryer, advertised in the CLAY-WORKER, we commenced to investigate the merits of your Dryer. Of course we were told that steam was a failure; but we saw it different and we must say that this Dryer has been put in by you people to our entire satisfaction.

Yours respectfully,
CORNING BRICK WORKS, by C. M. RUBRIGHT, Sec'y & Treas.

I. & M. WOLFF & COLEMAN,

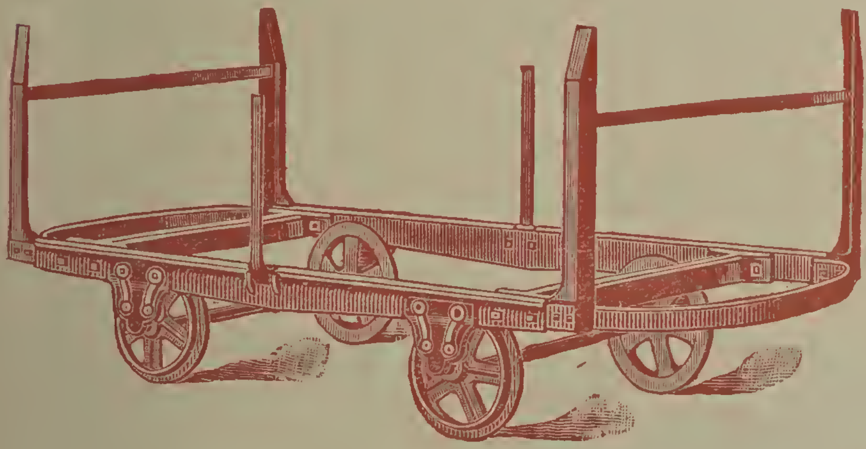
PATENTEES AND SOLE BUILDERS,

Write for catalogue.

No. 261 Dearborn St., Chicago, Ills.

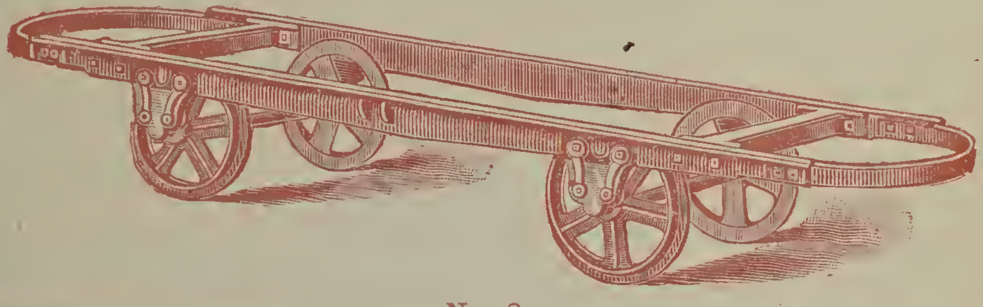
The Iron Clad Steam Dryer.

It will pay you to have your bricks thoroughly and equally dried before setting in kiln. You can dry them more economically in our Steam Dryer than in the kiln, besides getting a more uniform burn and better bricks. Handling and wheeling bricks costs money, and the bricks are often marred and in bad shape when they go to the kiln.


No. 1.

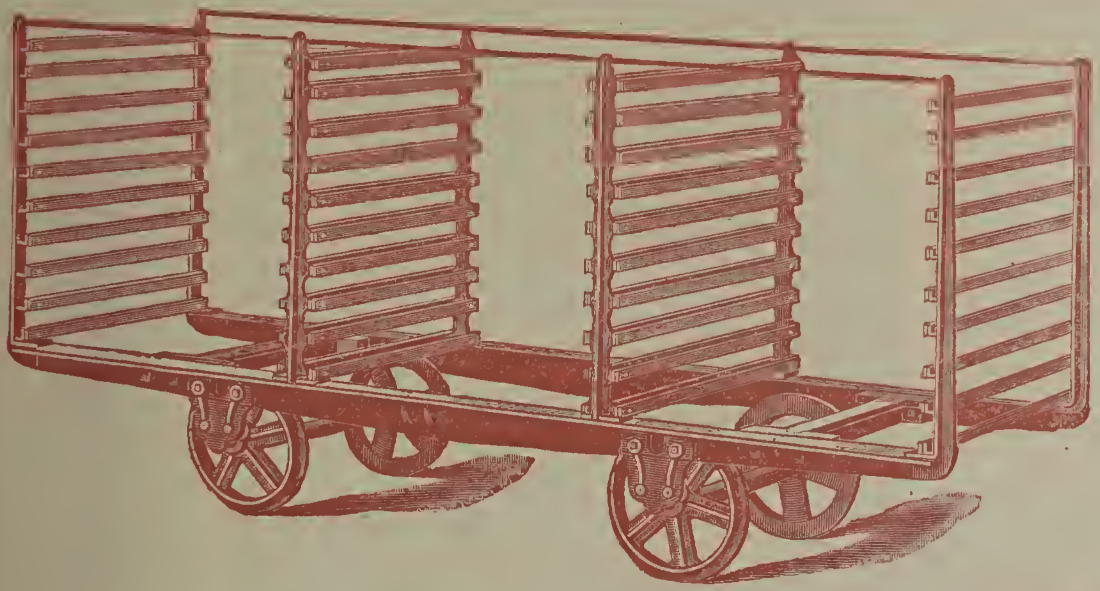
These trucks are strong and well made throughout, and the axles run in anti-friction rollers and are easily handled by one man:

Cut No. 1 shows our double decked car, which we use for all the varieties of brick, sufficiently stiff to be haked; on the lower deck of which we hake four tiers high, and on the top deck five. This car is suitable for all of the stiff mud brick made by the various Die machines. It is also adapted for the drying of dry pressed and semi-dry pressed bricks.


No. 2.

Cut No. 2 is a simple frame car which is used for foot pallets, or this car can be converted into car No. 1 or 3.

Cut No. 3 is for bricks that are too soft to hake and when pallets are necessary.


No. 3.

These racks, together with the car, are constructed entirely of Iron. They will be found strong, light and durable, and afford the best method of using pallets. They do away with the use of the foot pieces on the pallets, which are so much annoyance in handling. The pallets are made to slide upon the wrought iron bars which act as braces for the posts. We make these racks for the pallets to slide in lengthways of the car, so as to bring the side of the bricks towards the heat and also afford conveniences of putting in and taking out the pallets. You can reach across the car easier than lengthways of it. These cars are 8 feet 6 inches in length, and 34 inches wide.

No. 4.

Cut No. 4 is a substantial as well as a light frame—made entirely of wrought angle iron, and strongly braced, which is to be used for a top deck in the car, in cut No. 1.

ADDRESS,

I. & M. WOLFF & COLEMAN,

261 Dearborn Street, - - 14 Third Avenue,

CHICAGO, ILLS.

The Chicago Iron Clad Steam Dry House.

The merits of this successful Dryer are meeting with universal appreciation, and we are constructing them for Tile, Dry Pressed Brick, Semi Dry Pressed Brick, Stiff Mud Brick, and Soft Mud Brick.

In all sections of the country from Maine to Louisiana and for the many different varieties of Clay.

The loss by cracking, marring and breakage is less in this Dryer than in furnace dryers. We guarantee the consumption of fuel to be less, and the quality of bricks turned out better than in dryers using application of Fire Heat and the saving of expense of a special fireman.

Wooden Pallets and wooden buildings are used in our Dryer and the heating coils are protected by iron making it the only Fire Proof Dryer in the market.

I. & M. WOLFF & COLEAMN,

261 Dearborn St., CHICAGO, ILL.

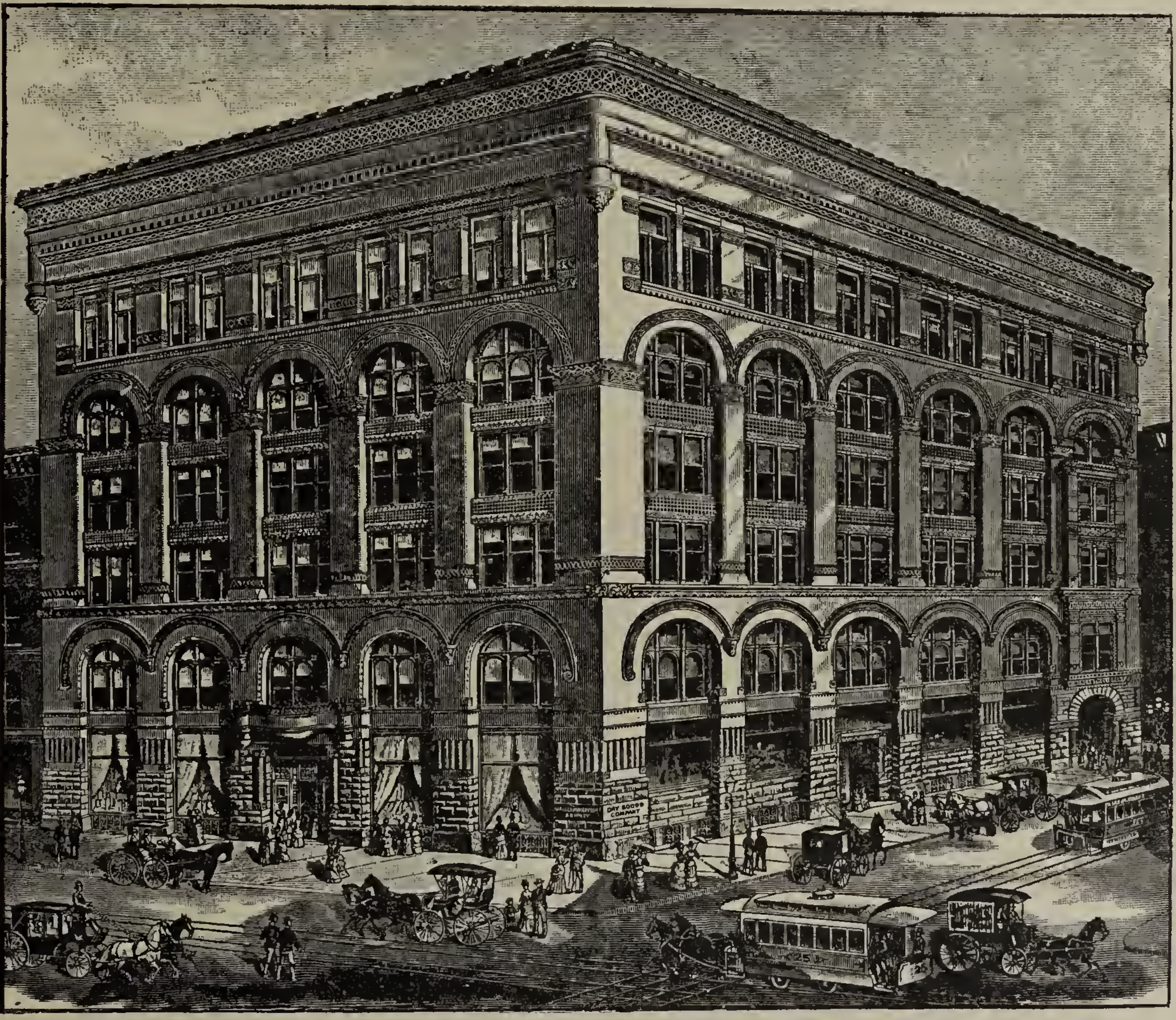
THE CLAY-WORKER

Vol. XI. INDIANAPOLIS, IND., JUNE, 1889. No 6

EXAMPLES OF AMERICAN BRICK AND TERRA COTTA WORK.

No. 16.

The Mercantile Library Building, St. Louis, Mo.



The Mercantile Library Building, St. Louis, Mo.
Henry G. Isaacs, Architect.

The wide, almost national, reputation of the St. Louis Pressed and Ornamental Brick leads one naturally to expect, on visiting that city, to find it built up largely of this, the best of all building materials.

To some extent one may be disappointed to find that like all old cities St. Louis, generally, presents a painted front.

Of late years, however, many large and imposing structures have been erected and most of them are of brick and terra cotta, of superior quality, that is so pleasing to the eye and needs no paint to hide natural deficiencies.

The subject of this sketch, The Mercantile Library Building, is among the most prominent of these. It was completed in 1888.

The lot on which the old building stood and the new building stands is located on the southwest corner of Broadway and Locust Street, fronting 115 feet on the former and 128 feet on the latter. It cost in 1851 $25,500, and its value is estimated to-day at $400,000. The new Library building, with equipment and furniture, cost nearly $400,000 more. This building is six stories in height. It is built, as to its principal parts, of granite, brick, terra cotta and iron, and is fire-proof throughout. The style is Romanesque and is treated in a broad, massive manner; the lower story is of red granite, with a degree of ornamentation which gives effect to the rough, quarry faced treatment of the granite. The upper portion is of brick, with the architectural members of terra cotta, such as the capitals, bases, and the archivolts of the round arches. A parapet cornice, of brick and terra cotta, crowns the structure. The interior, columns, floor beams, and girders are of iron, protected by burnt clay tiles; the floors are filled in between the beams with burnt clay, hollow tile flat arches, and the roof is similarly constructed. The library occupies the whole of the sixth floor and one room on the second floor, which has been reserved for the meetings of the directory.

Entrance to the Library is from Locust Street, at the northwest corner of the building. It is of granite work, round-arched, with columns and richly carved capitals and opens into a handsomely furnished vestibule, or reception room, marble-floored and finished on walls and ceiling in paneled and polished oak. From this room a hydraulic elevator of the most approved construction, superbly appointed and running within a brass-latticed frame of elegant and ornamental design, ascends to the sixth story in twelve seconds, making the descent in ten. A stairway of stone winds upward around the elevator frame and both stairway and elevator open into the issue room. This apartment is floored with marble tiles and is finished in quartered oak, with the walls and ceiling decorated in color.

Written for the Clay-Worker.

BRICKMAKING AND BURNING.

No. 3.

BY JNO. W. CRARY.

I have said in article No. 2, that brick properly made of dry pressed clay, are superior to those made of soft tempered clay. I stated how dry press brick should be made, and my statement was not based upon theory, but upon actual and successful experiment at different times and places, and in different clays. At one place I had charge of a dry press machine that made twenty thousand brick per day of tempered clay, molding by hand. I set and burned both kinds of brick in the same kiln, about half of each. I found that the dry pressed brick "dried off" slower than the mud brick, and the fire was slower in getting out at the top, but after the "fires were up" the dry pressed brick burned out faster than the mud brick, and were ready to be "closed up" sooner, though "fired" the same way, but slower the first thirty-six hours. Those brick were made for the large United States Custom House in New Orleans, in 1850 and '51. The officer in charge came to our yard to inspect the first kiln, which was very thoroughly burned, and though prejudiced against dry pressed brick, after a fair and full test, pronounced the dry pressed brick superior to the mud brick.

This brick yard was on Biloxi Bay, in the State of Mississippi. In 1856 to 1860, I had charge of a company's brick yard on Escambia Bay near peninsula Florida. The concern was making brick for the U. S. Government, under a contract for sixty-five millions, to be used chiefly for the building of Fort Jefferson, "Dry Tortugas" in the Gulf of Mexico. The company at first, made brick altogether by hand—forty thousand per day was the "output." In 1858 we put up a dry press machine, which turned out an average of thirty-three thousand brick per day. Carrying the brick into the kilns on belts and from them "tossed" to the "setters," at the same time we made twenty-five thousand brick per day by hand. I set both kinds of brick in the same kilns. I set them five brick in a "bench" and from forty-eight to fifty brick high, our contract was for first quantity, whole hard brick, and large high kilns turned out the best, we shipped ninety to ninety-five per cent. of our brick to the U. S. Government. I found the same results in the burning, and character of the brick, as I had experienced before. The clay in both these cases would not melt or shrink in burning, even with fine, light wood fires, which, with a good draught, is as hot as any smelting furnace. The dry pressed brick were tested at Fort Jefferson, and carried fifty per cent. more pressure, than the best mud brick of the best samples that could be found. I have made and burned dry pressed brick, in seven different places. In two, the clay would neither fuse or shrink in burning. In the other five places, one in New Jersey, one in New York, one in Maryland, and two in Iowa, the clay would fuse, "settle" in burning, from four to eight inches, and took twenty per cent. less wood or coal than the infusible clays.

THEORY OF UNITING PARTICLES OF CLAY IN A BODY.

A brick made of soft plastic clay, contains about twenty-five per cent. of water in weight. If the clay be strong or pure and thoroughly tempered, it will absorb about thirty per cent. of its weight in water when tempered soft enough for easy hand molding. It is evident then, that the particles of clay which are infinitismally small, are surrounded by water to a certain extent so that when a soft brick begins to get dry a partial process of crystallization of the clay begins on the surface, and as evaporation goes on, the crystallization or cohesive attraction increases, until the brick is hard enough to handle, or nominally dry, though theoretically damp.

If we take such a brick and break it, and examine it, we find the particles of clay cohered in sharp edged crystals, but pointed at their angles, so as to allow the water to escape, and leave one compact body but full of pores. We call this a solid, dry brick.

Now if we take a brick of this kind, and put it in a die, and apply one or two tons pressure, it is crushed, if the pressure be increased to ten tons, the particles of clay begin to assume their natural position of cohesion, and as the pressure is increased, cohesion follows in the same ratio, until it becomes perfect, and the brick that a moment before was crushed to a disjointed mass of broken crystals, has now become one perfectly dense, solid body, without a single pore, unless made by confined air. A perfect dry pressed brick, well burned, will absorb but very little more water than a stone, and is about sixteen per cent. heavier than a mud brick of the same size.

THE MAKING OF A PERFECT DRY PRESSED BRICK DEPENDS ON THE CONDITION OF THE CLAY.

We hear of "semi-dry pressed brick." The well informed brickmaker, would call that by its right name, which is "stiff mud," and poorly tempered, because it is impossible to make clay plastic, or compel it to cohere, like well tempered soft clay, by any process of disintegration or co-mixing. "Semi-dry clay," as very damp clay is called, cannot crystallize, it is not sufficiently wet, comminuted and plastic. It cannot be perfectly cohered by pressure, because the presence of a considerable amount of water intervening between the particles of clay, prevent perfect cohesion.

The natural dryness of clay is the right condition.

If clay be spread out in the hot sun, until it appears perfectly dry, it still retains a certain amount of water, and if perfectly pulverized, may be pressed into a solid body; but the moisture is not properly equalized, until sun-dried clay has been at least a week, packed under a shed; then it becomes pulverulent, and easily yields to the action of machinery properly constructed, and a comparatively solid body is made, much more tenacious, hard and strong, and less liable to warp or fuse by heat, than if molded of tempered plastic clay. I know of a clay working manufactory in a large northern city, that tried every possible way, at great expense, to make floor tile to compete with the celebrated "Menton" English tile, out of tempered moldable clay, but failed in every experiment. At length, finding they could not get the secret from the English manufacturers, they were about to abandon the effort to accomplish the enterprise. Just then, they accidentally got one of my circulars, which I had published, to show the theory upon which my dry press brick machine worked, which I had put in operation at Baltimore. Then they pulverized their clay thoroughly, and by means of proper dies and pressure, succeeded in making a first rate floor tile, every one was true, straight, and of uniform size, and hard as steel. I did not know how "Menton tile" were made, until long after I had conceived of, and practiced the same theory.

Dry pressed clay will stand fire much better than tempered clay. In the kilns where I have set and burned both mud, and dry pressed brick, I found the "overhangers" on the "arches," of the dry pressed brick, perfectly sound and solid, while those of the mud, or semi-mud brick, were cracked and easily broken. I have used dry pressed "overhangers," over and over, ten times, for "overhangers" in the mud brick part of the kilns.

The reason for this difference is, that a dry pressed brick, being more dense than a mud brick, does not heat so fast, or cool off so fast. What constitutes a good "fire brick," is its ability to stand sudden temperatures of heat and atmospheric changes, without fracture, as well as to stand intense heat.

THE PROPER WAY TO SET BRICK IN A KILN FOR BURNING.

I will not in this article, express my opinion as respects the best kind of kilns for brick burning. There are so many different kilns and ideas connected with this business, that it is not easy to make a choice. The main thing involved in the question of kilns, is economy in labor and fuel, "quality" is not a factor of any importance in the construction of a brick kiln. A perfect brick can be burned in an old-fashioned, "cased up" kiln. The great art and secret is, in the setting and burning. No kind of a kiln will turn out a perfect brick, without these capabilities and conditions. We had just as well try to make a forge, that would temper steel, without the hand and eye of an expert.

Brick should be set in a kiln, so as to get the best draught, and combustion of fuel, leave the least fire marks on the brick, and get the best distribution and equalization of heat.

To do all this now, I will take, for instance, an old style kiln to build. I will build the side walls twenty-five feet apart inside, they shall be at least three feet thick at the bottom, and tapered on outside to 18 inches on top. If the clay stands fire well, I will build the furnaces so as to allow a "bench" for "overhangings," five brick wide; if the clay fuses easy, will make the benches four brick wide. Having my kiln ready for "setting." I will set my brick zigzag, or "skintling," so that if two brick are set on edge, one-half inch apart, one brick set on two would cross them diagonally, so as to rest on the outer corners of the lower brick, the divergence of parallels, of upper and lower course, would be, as a rule, one half the thickness of the brick. I will set this bench five brick high, and set them to average half an inch apart. I will then start my "overhangers" and set them the same as the benches. The first binder over the closing of the "overhangers" I will set close, so as to spread the fire; all other binders I will set loose. Now I will put on the cross, "running course," loose, then I will start over these "cross courses" and if I want solid, even colors on the edges of the brick, I will set two courses one way, brick over brick all the time, before I cross them, thus preventing "fire marks," except when the courses are reversed. I will thus proceed to top of kiln, then "plat" with burned salmon brick, if on hand, if not, will use dry unburned brick. The "platting" should be laid flat, and about one inch apart, so as to leave a good draft and escape for watersmoke.

Written for the Clay-Worker.

HINTS ON BRICKMAKING.

No. 36.

BY "R. BRICK."

Many brickmakers who have one machine with a daily capacity of 25,000 brick and an engine of sufficient power to run it, when they wish to increase their output, buy an additional machine. This necessitates buying a larger engine and boiler, the number of employes are increased 100 per cent., more space for drying and burning is required and buildings enlarged, tools must be furnished for twice as many men as before, in fact everything must be duplicated. This is done in many cases where the first machine has never been run more than five or six months in a year. Now it would appear a plain business proposition, that the first machine ought to be run to its full capacity before incurring the expense of a second machine with all its attendant expense.

One machine making 25,000 bricks per day and running 24 days per month will make 600,000 bricks, and running ten months a year would make six millions of bricks. There are many brickmakers who do not make more than half this amount with two machines.

To make six millions of brick per year with one machine it is necessary to have artificial heat for drying, and this method I think cheaper than natural drying. The bricks occupy less space, and in this way saves moving brick long distances from machines to drying floors, and again from drying floors to kilns, also cost of haking, covering and uncovering is saved. Again, the loss which attends outdoor drying is avoided, certainty takes the place of uncertainty, so far as the quantity of bricks made and saved is concerned. These advantages and savings will more than pay for fuel required to dry them under cover, where they can be dried in rainy as well as clear weather and winter as well as summer. In order to make brick every day it is necessary to have a few days supply of clay under sheds, to draw from on wet days when men cannot well work outside.

One objection offered against making the whole year is, in fall and winter there is little demand for brick, and provision must be made for storing the product.

Bricks can be moved from the kiln to the stock pile at a cost of from 20 to 25 cents per thousand. By doing this the demand can be met in the busy season, even though it is double the capacity of the machine. When there is a large demand for bricks the prices invariably rule from 50 cents to $1.00 per thousand higher than in the dull season. This more than repays the cost of storing the burned brick. The wise and successful brickmaker is the one that in dull times looks ahead and prepares to meet the future demand, and when it comes sends out his accumulated millions of bricks at a good price. While his short-sighted competitor says, "If I only had a lot of brick," and talks about bad luck and such nonsense. It is lack of nerve and foresight. I have seen this thing occur many times repeated and will see it often again. A brick manufacturer may not have orders for 100,000 bricks on the 1st of January, and a million on hand; by the first day of April following, that million has gone where all good bricks go—in the wall—and he will have orders on his books for two millions more. This is not a supposed case but an every year occurrence with hundreds of brickmakers. Pile your bricks up. Burn them well, so they will stand weather, and you have the best stock in the world. The moths will not tackle a hard brick more than once, and it will be the moth that is damaged and not the brick—and they are too cheap to steal; they are indestructible; they are fire-proof, frost-proof, and cyclones pass by them on the other side; they never get out of fashion, therefore, need not be sold at cost. Where, on this uncertain earth, is there anything so safe as money invested in a pile of well-burned bricks, that have been well made?

Now, it seems to me, it would be better—more satisfactory, because more profitable. to prepare to run your present machine steady, than to buy another and let them both rust out two-thirds of the year, while the employes are thrown out of employment in winter just when work is scarce. Get a good set of men, give them steady employment through the year, and employer and employe will be richer at the end of the year. "Go to," build you a dryer and permanent kilns and sheds, make all the brick possible with the machinery you now have before going off and buying more machinery, and leaving that which you now have to stand idle the greater part of the year.

Written for the Clay-Worker.

POTTERY.

No. 4.

Perhaps of all very simple looking things the "perfect brick" is the most deceptive. One may say what one pleases about art in architectural terra cotta; it all would be as dead sea fruit were it not for the "perfect brick." We might as well look for the highest art of sculpture without marble as a terra cotta art that was not born of a brick. Simple looking as it is, it took a thousand years to learn how to make one. Indeed, the perfect brick really was not born until a few years ago when it came as a sort of apotheosis of modern mechanical art and could not come before because the highest skill in mechanical art had to precede the "perfect brick." But this is not all; the science of chemistry had to be born, expand and finally reach its present perfection before a perfect brick could be made.

These remarks may have a strange sound to many who have not given the question much thought. Not only a perfect brick, but what we would call a fairly good brick, requires a thorough knowledge of the constitution of clay deposits, long and varied experience in attaining the best results from clay banks, which each vary so much that a treatment given to one that would produce a perfect brick were it applied to another, would produce the worst, most worthless brick.

The writer draws from his experience. He remembers a friend who had accumulated a competence and lost the whole of it because he tried to make a perfect brick out of clay surcharged with lime—hardly a decent brick in the kiln. His ambition was drawn from the success of another friend of the writer, who had made a fortune in making good bricks—but alas, they were yellow bricks—until that undesirable color had been entirely superceded in public taste. This second friend, however, spent a considerable part of the fortune in trying to freeze out a poor fellow (but who knew how to make brick) who searched until he found the clay he wanted, and behold a good and fashionable red brick. He did not freeze out any more than a Canada thistle. He grew wealthy and his competitor in good but yellow bricks, stumbled along until finally he doled out his yard into corner lots and so bade an agreeable and final adieu to the brick field.

The Egytians made an almost worthless brick, that is if we were to subject it to our rigorous climate. Nothing ever disintegrates in that dry, hot climate. The Babylonians, indeed, burned some of their brick but they were by no means the brick that would compare with ours, despite the antiquity of association. The inhabitants of India made brick, but they were sun dried and would become excellent hot house soil about the third winter in our northern clime. The Romans, indeed, made good brick—good as any hand-made brick—but they did not make such because they knew how, but because Nature had provided them with a clay so perfectly adapted that nobody, by any means, could make a really poor brick out of it. This was merely chance. I have no doubt that if the noblest Roman brickmaker of them all if he were to be asked why he made good brick, could have told us the first useful point.

Modern science has enabled us to answer. It has also enabled us to do away with chance and always make good brick if we will. To be sure, many poor brick are now made, partly because the brick maker does not consult the fund of information that his special papers bring before him, but often because his environment will not furnish him a good material.

The perfection of brick and terra cotta machines has enabled the modern brick maker to do what none who preceded him could do—make a perfect brick. The hand made brick was light and porous, compared with those forced out with the enormous pressure of the machine. This gives us a smooth, dense, lasting brick and by the addition of art gives us a terra cotta that is nearly as useful as marble for architecture; far cheaper, more mobile and in many cases even prettier. The writer, of course, takes it for granted that the clay and its treatment are of the best.

We have succeeded in making the perfect brick. We are applying our knowledge in producing an art that may utilize this to the highest. As was suggested in our paper last month, this art was so appreciated that scarcely a modern house of any pretensions, that does not utilize this last product of the brick makers' art. Indeed, it is rapidly trenching upon the domain of the highest art capable of expression. It is doing more than this, even; it is producing these expressions of art at such marvelous cheapness that the most fanatic and poverty stricken apostle of democracy will have some of it on his house or on its mantels.

The future of terra cotta is as boundless as the demands of architecture and art for house and household decoration will admit and with the genius of our people in home building and our appreciation of the beautiful; this means that the art is destined soon to become one of the leading industries of this country.

The efforts of all terra cotta workers should be towards the study of form and an acquaintanceship with the works of art of all countries and ages. The prevailing rage is for Mediævalism and dragons, griffins and serpents grace the head pieces of lintels, fireplaces and pediments. As designs, they are expressive and often fitting, but they are being used too extensively and a monotony of design is already apparent that is needless when so many other forms of expression exist that are equally expressive and much more life like and beautiful. Perhaps this is due to the predominance of

German thought and German people, in the terra cotta work of this country with its grand, somber, gloomy but chaste spirit. A little of southern liveliness and human spirit could be borrowed with great good to the popularity and taste of the art and would, by contrast, improve the confessedly powerful impressions from the Germans. The specimen represented in the cut is a case in point, a companion piece to one given in last month's paper. The worker in clay will conceive numberless situations, especially for interiors where those designs would apply with happy effects.

Written for the Clay Worker.

THE DRY PRESS PROCESS FOR THE MANUFACTURE OF COMMON BRICK.

BY W. D. RICHARDSON.

No innovation in the methods of brick manufacture has been so radical, and hence so decried and disparaged, as the making of brick out of dry clay. The history of this process is largely a record of failures, but repeated failures, in our own, as in all arts, have formed the groundwork of success. Even the men who derided these attempts and said, "I told you so"—"It can't be done," are to-day forced to admit that the brick turned out from these dry press brick works never have been equalled in all the requisites of a durable and ornamental building material. That the dry press process is the cheapest and best for the production of face brick, wherever the clay is suitable, needs no further proof than that afforded by a few minutes observation at any successful establishment. But the question which is now agitating the minds of many brickmakers is: "Is the dry press process practicable for *common* brick?" that is, "Can common brick be made cheap enough by this process to compete with those employing the other processes?" Here is a wide field for discussion, though the subject was so lightly passed over at the Memphis convention.

Let us first consider the affirmative side of this question and investigate the advantages of this process over all others:

1. *Cheapness of handling the green brick.* The brick having been placed upon trucks by the off-bearers are wheeled by the tossers direct from the machine to the kiln.

2. *No loss by exposure to weather.* This is a manifest advantage over the method of haking on ground or racking on pallets, not only on account of there being absolutely no loss, but because of the relief from all anxiety on this score. The brickmaker employing this process can go to bed at night knowing that the day's output is ready for the burner.

3. *No expense of building and operating dry houses.* This advantage is nearly off-set by the expense of building clay sheds and of storing clay. Clay sheds, however, are cheaper in construction than dry houses and clay can be handled at less expense than brick.

4. *No loss of time by inclement weather.* The brick can be manufactured the entire year, if desired. All contracts can be fulfilled promptly and advantage taken of a high market. Moreover, laborers employed in all kinds of weather throughout the year can be secured at a lower price.

The above are some of the chief advantages of the dry process and need not be expanded further.

On the negative side of this question may be mentioned as disadvantages of the dry press process:

1. *Greater cost of plant.* The buildings, machinery and kilns suitable for the manufacture of dry press brick, are much more expensive than those needed for the manufacture of soft or stiff-clay brick. Moreover, considerable capital must always be tied up in the storage of large quantities of clay. Wherefore this process is beyond the reach of the majority of brickmakers.

2. *The process being more modern and scientific, there is greater difficuly in securing competent men for the responsible places.* No one should undertake this process without the services of a man that has had a successful experience with it. The neglect of this advice has caused many disastrous failures. As such men are scarce a larger salary must be paid than for similar services in the older processes.

3. *Brick made by the dry process require more fuel and a longer time for the burning, since they contain more clay.* Moreover, the burning of dry press brick properly requires special knowledge and experience, and competent men for this are in demand at prices a little in advance of others.

4. *Dry press brick are heavier and hence the cost of transportation is greater.* In some cases this may not be an appreciable disadvantage, but where competition is sharp, cannot be disregarded.

Now, having considered briefly, in a general way, both sides of this interesting question, what conclusion can be drawn? None that will be applicable to all cases. No process of making brick will ever be universally adopted, for the reason that no process is best for all conditions. Least of all will the dry press process, for reasons already stated, come into general use. That it is becoming more extended each year is evident, and the day is near at hand when nine-tenths of all the fine face brick, plain and ornamental, will be made by this process. It is doubtful, however, if this process with the machinery now in use, can be made profitable for the manufacture of common brick, exclusively. I am aware of the claims of press manufacturers but I do not know of anyone that has succeeded in fulfilling these claims. But where the clay burns a good, salable color for face brick, both common and stock brick can be advantageously made at the same works, on the same machine if desired—the stock brick being set in the most favorable part of the kiln.

These remarks do not apply to the Hydraulic Press perfected by Mr. Graves, of St. Louis. This machine is unquestionably far in advance of all others, and, with suitable clay, will make profitably any grade of brick.

A few words, in conclusion, to those who contemplate embarking in the dry press brick business. Be sure that you have plenty of capital—ten to one-hundred thousand dollars will suffice to start with; have your clay thoroughly tested by disinterested parties; secure the services of a competent brickwork's engineer to build your buildings and kilns, select machinery adapted to the clay and start on the right track. Then, by perseverance and "eternal vigilance," success will be yours, and the satisfaction of contributing to the comfort and well-being of your own and future generations by providing them with a building material, cheap, handsome and durable.

CLAY BONNETS.

"Among the most curious people of this continent," said a traveler, "are the native Peons of Mexico, and when you look at the female portion of that unaccountable race you get a curious representation that makes you pause with wonder.

"Living on the borders of Arizona and Mexico, as I have for nine years past, I have had a good opportunity to see many things that most transient people would pass by unnoticed. The longer I stay the more I am impressed with the unaccountable ways of the descendants of the Aztecs. The society 'lady' of the Peons, if I may speak of her as such, has a way of doing up her back hair that I have never seen duplicated anywhere.

"It is no less than to put a great clay crown on the top of her cranium, in which the hair is matted like pigs' bristles in plaster. This crown reaches up say eight or nine inches and looks like a great plaster cone. It serves a double purpose. Not only is it worn at evening parties, but throughout the day. Indeed, the primary object of the mud cone was to protect the head from the intense heat of the southern sun. Now, however, it is worn at evening balls, and no 'lady' thinks herself *recherche* and in positively good form unless she has her novel crown on. The hair is matted and twisted and coiled all around in it, and it may be depended on that it can not come loose and come tumbling down and cause her any embarrassment in company. The longer a cone is worn the harder it gets, and when it has reached the age of a month, say, it is as hard as a brickbat, and would have to be smashed to pieces with a sledge if there were no other way discovered. This, however, happily is the case.

"The old Aztecs invented, and the secret has been perpetuated in the race, a peculiar solution compounded from wild plants which knocks the plaster topknot to smithereens. It takes some time to do it, however, usually from five to six hours, and during this time the lovely Aztec maiden or matron must soak her head in a big jar of this solution. It is the proper thing for the women to change these cones at least once a month. After that the whitish soil of which it is composed changes to a dull yellow and the wearer loses caste. And there is caste among the Peons as much as there is among any other class of people.

"These native women are fond of necklaces, and you will often see them going about with nothing on except a necklace and a mud crown. Others again will have slight raiment. The men do not wear mud crowns, but they are often as limited in their attire as the feminine sex. Their habits are extremely simple in the main, though in some other respects they go off on wild tangents."

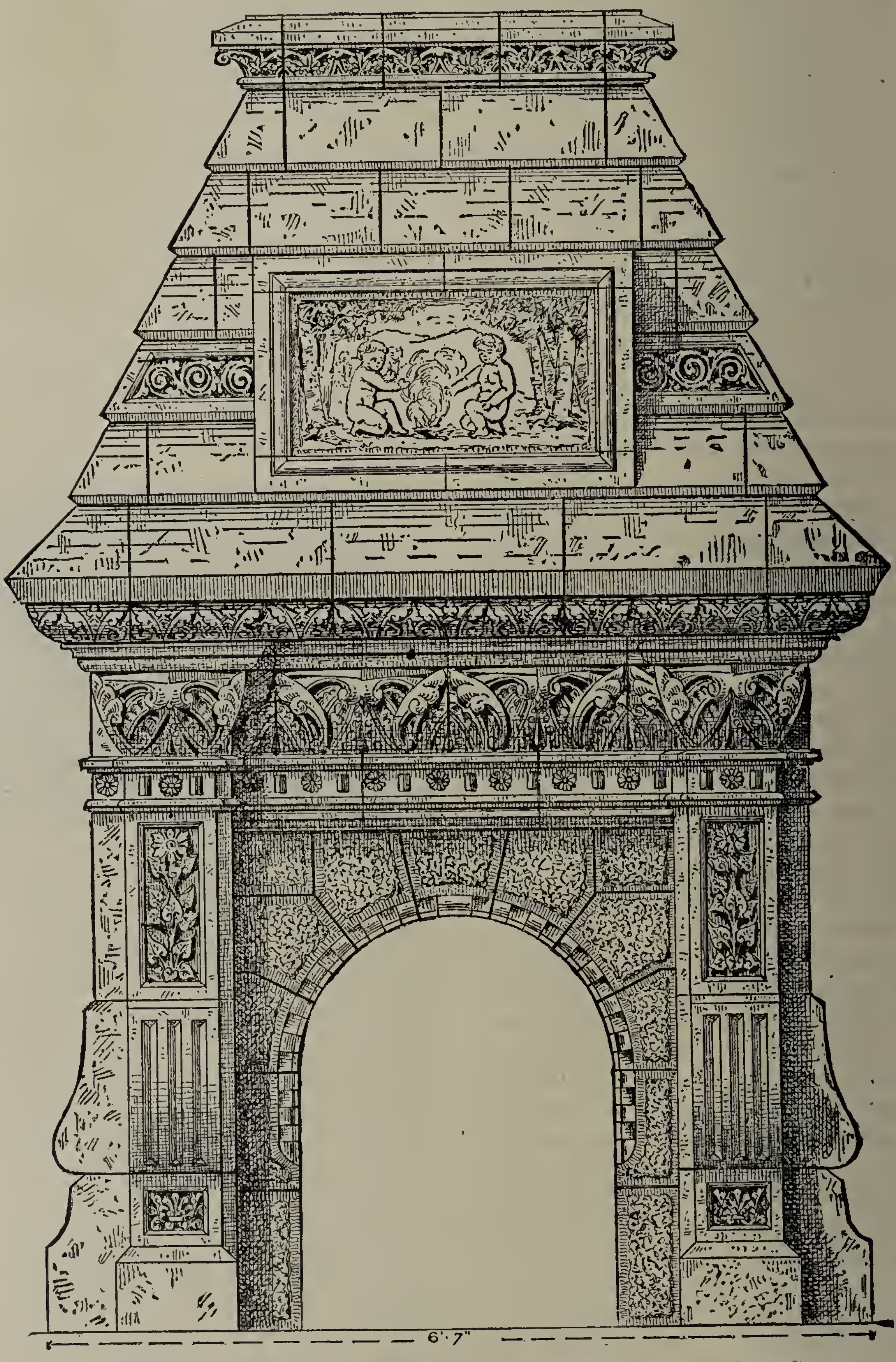
* * * —*San Francisco Examiner.*

The durability of brick walls is very much effected by the character of the mortar used in laying the brick, and the condition of the brick when laid. Clean, sharp and rather course sand should be used for mortar, and the lime should be water-slaked and fresh.

DESIGN FOR A MANTEL

By The Indianapolis Terra Cotta Co.

Such designs are interesting to constructors and become generally so to the public as attention is directed more and more to ornamental forms and colors. The use of terra cotta and ornamental brick will increase in proportion as the public taste is educated in this direction. There is indeed marked progress along this line already attained and in the future construction of buildings intended to be durable and pleasing to the eye, terra cotta will enter more largely into their construction both outside and inside. In the illustration herewith presented to our readers, is a pleasing design. It will serve, we trust, to increase the interest in the revival of this ancient art. There are few buildings even now, in the larger towns and cities, that are intended to be imposing in appearance that are not constructed so as to ornament them with terra cotta panels, and the more terra cotta the better. Well made terra cotta will resist the disintegrating influences of the weather, is more lasting than stone, granite or iron, either of which yield readily to the action of fire. In addition there is a richness in bright or deep red terra cotta that commends it to the eye, and the judgment, knowing as we do, that it will last through the centuries.



Terra Cotta Mantel. *M'f'r'd by the Indianapolis Terra Cotta Co.*

Written for the Clay-Worker.

MANUFACTURE OF SEWER PIPES AND DRAIN TILE.

BY CHAS. T. DAVIS.

The clay from which sewer pipes are made is a grade of fire clay. Much care is required to be exercised by those who select the clay from which sewer pipes are manufactured; the coarse, open, non-plastic clay used for fire bricks will not answer the required purpose. Earthenware pipes of this character require that the clay shall be plastic so as to form a close, homogeneous body similar to that used for architectural terra cotta. It is also desirable that the clay should contain a large proportion of silica, which is a material assistant in applying the salt glaze as will be hereafter explained. The clay should be dug in the autumn or winter, and exposed to the action of frost as by thus "weathering" the clay its particles are disintegrated, the water diffused through the substance expands by freezing, thus breaking the clay in every direction. The more extended the period of exposure. the more effectually is the clay reduced and easily tempered and formed into pipes. But in these times of rapid production, the digging of the clay in the autumn and "weathering" it are not usually attended to; but to neglect it, however, is to run the risk of having the drain pipes unsound as well as faulty in shape.

The clay before being used is placed in a pit usually at the rear of the pipe machine and is allowed to soak in water over night. But a large number of manufacturers of sewer pipe in order to save the expense of digging the clay in the autumn and placing it in and removing it from the "soak pit," employ rollers for grinding the clay, which, after being disintegrated, passes into the tempering cylinder. This method of disintegrating the clay for sewer pipes answers only imperfectly as a substitute for digging and weathering the clay. Limestones, as well as lime pebbles are often diffused in the clay from which sewer pipes are made and it is necessary that such extraneous matter should be removed as much as possibe, for in the kiln the limestones and lime pebbles are converted into caustic lime and if the glaze has been imperfectly applied, or if from any other cause the moisture or carbonic acid which is always present in sewers and penetrates when once admitted, to every part of a pipe, slacks the nodules of lime, the swelling causing the pipe to burst and break to pieces. Costly drains have often been destroyed in this way and it is therefore worth while for engineers and architects to inspect the sewer pipes that are being used in works over which they have supervision and to observe that all lengths of pipes and connections are properly glazed. Manufacturers and plumbers charge for perfect goods and there is not the slightest excuse for expecting them to accept inferior half-glazed or porous material. It is with clays containing diffused limestone and lime pebbles that disintegrating rollers are most useful.

Clay used for the manufacture of building brick will make good drain tile. Care should be observed however, not to have the clay too sandy as tile made from such clays would be too weak to stand long shipment. In mining the clay from the bank it should be thoroughly mixed from the top to the bottom of the clay bank and some clays when thus mined and mixed give good results when the clay is taken directly from the bank. Other clays require to be dug in the autumn or winter and exposed to the frost while others may be spaded up and exposed to the action of the air for a longer or shorter time with beneficial results. Clays of all characters used in the manufacture of drain tiles will be more or less improved by being run through a pulverizer. It is only through practical test that the best clay can be selected for the manufacture of drain tile, as it is impossible to foretell the various peculiarities which will be developed in drying and burning various clays. One rule, however, may be laid down—that is, that an open, coarse, gritty, sandy, non-plastic clay will not make good drain tile. The clay used for this purpose should be plastic, smooth to the touch and possessing such characteristics as would commend it for the manufacture of a good grade of building bricks. Any clay selected for the purpose should possess the quality of drying in the open air without damage, if possible, as the expense of drying by artificial means should be avoided.

In most of the machines now in use for moulding sewer pipes the tempering machinery is connected with, and forms part of moulding mechanism, but in other contrivances a quantity of tempered clay is placed in a cylinder which is refilled as the material becomes exhausted. As in brickmaking, so in sewer pipe and tile pipe making, there is a very large number of machines intended to economically shape all the different styles of pipes as well as others to handle it as the pipe comes from the dies, and others still, to cut the clay tubes into rings, etc. The straight lengths of pipe are shaped by forcing the tempered clay through a die chamber at the end of the pipe machine which is fitted with exterior and interior dies, the difference in the diameter of which, regulates the thickness of the material constituting the pipe. Sometimes the lengths of pipe are made with a projecting flange or socket on the one end, and at other times the pipe is plain, the connection being made with rings which are made separate and are called collars. The latter method being the most common way of connecting all pipes exceeding twelve inches in diameter.

The lengths of pipe are received from the press upon tables and endless belts of various designs. Some of the tables have flexible straps which conform to the outer surface of the tile and prevent it from becoming flattened or otherwise disfigured in shape as would be the case were it carried by bars which did not conform to its surface while in a soft and plastic state in which it issues from the dies of the machine.

The larger sewer pipes are sometimes made so as to allow smaller sized pipes to enter them at an angle. S-traps, T-pieces, X and U-pieces, elbows, etc., are made for the different sizes of pipes; they are separately moulded and are somewhat more expensive in proportion than the lengths of pipe.

The curves, elbows and traps for sewer pipes are made by machines especially constructed for the purpose, which are so arranged that by moving a plate placed over the mouth of the die, the clay can be made to issue more rapidly from the opened side than the other. The curve is formed in the pipe toward the side on which the space is contracted. By sliding the plate on the other side, the pipe will curve in an opposite direction and by a succession of movements of the plate, any desired form of curve or trap can be formed.

The contrivances employed for forming sockets or curved earthenware pipes are also very ingenious and in order to explain the machine used for this purpose it is necessary to state that ordinarily to form such sockets or sections of straight pipe the outer die is prolonged beyond the point of discharge of such length and inside shape as to form the outside of the desired socket. When, however, the pipe curves as it issues from the orifice, this device is impossible, as the issuing pipe encounters the edge of this socket-die and is destroyed. In order to obviate this difficulty the socket-die is constructed separately from the other parts of the machine in the form of a ring divided into two parts so as to permit of its being removed. By means of a lever this ring is firmly held in place until the socket is formed when by a combination of arms and links the ring is opened automatically and the socket having been formed, the curing is proceeded with.

After the pipes have been formed, the next step in their manufacture is, of course, that of drying, and this is proceeded with upon various systems. In the Western States where large quantities of sewer pipe and drain tile are manufactured, the factories for the production of this class of earthenware are of both timber and brick construction. When the latter material is employed, the walls are commonly built hollow in order to lessen the dampness. Architects are often called upon to make the drawings and specifications for tile factories, and as the drying is an important step in the manufacture of earthenware pipes it may not be objectionable to inject here a few remarks on this subject, especially since the writer has often been requested to point out the defects and suggest methods by which errors of this kind could be remedied. A common method is to construct the factory, say, 40x60 feet and make the stories seven feet high, the top story, of course, being increased by the pitch of the roof. The floors are well supported and covered with 2x2-in. strips laid one-half inch apart. On the roof there is usually a ventilator running the length of the factory. Wrought iron pipes usually one inch in diameter, are placed underneath the joists with headers at either end for heating. The pipes are commonly divided into four sections so that all or but one section can be used for heating at one time, the idea being to control the the steam, turning it in any division of the factory that may be desired.

The great drawback to this method of drying is that the dampness driven off from the freshly moulded pipes stored in the lower stories, remains below and can not pass through the upper stories, thus retarding the drying of the stock in the lower stories. The best plan is to lay the flooring as has been described and if the factory is a frame structure, to hang the weather boarding near the bottom of the room on hinges and allow the pipes used for heating to pass around the story, securing them to the upright studding. If the structure is of brick, coils could be placed across suitable openings.

Drain tile are usually dried in sheds more or less open in their construction, which have doors so arranged at the side of the shed as to allow the admission of air in the drying apartments in such quantity as may be needed and as the nature of the clay may require. At proper places in each ceiling there should be suitable openings having ventilators leading therefrom and passing through the roof, thus creating a constant draft and separately carrying off the dampness from each story. Experience has shown that the sides are the proper places to arrange the pipes for the steam and the current of air from the outside is usually sufficiently strong to force the heated or dry air to the center. The effect of side openings other than the kind mentioned, is to create counter currents thereby destroying the whole effect. Without such openings the air forms a current up the sides of the building and does not reach the center.

After the pipes have been thoroughly dried they are placed in the kilns, which are of various constructions, some being operated on the up-draft and others on the down-draft system. But the old form of circular oven, so much employed in Staffordshire, England, is found to answer the purpose, and perform the burning more thoroughly than most others in use.

In placing the pipes in the kiln much care is required to be exercised, for in the manufacture of sewer pipe it not unfrequently happens that much of the pipe comes out of the kiln in which it is burned in a greatly damaged condition, the pipes having gotten out of place during the burning, and become bent or adhering together in masses.

Sometimes in order to prevent this displacement of the pipes when in the kiln each pipe in the top tier is secured to its neighbors by means of binders made of clay, like that of which the pipes are made and baked or burned in the manner usual in this art. Binders are also used to connect the tier of pipes with the wall of the kiln, special bricks being built into the wall to engage one end of the binders.

It is customary to place elbows and other connecting pipes on top of the upper tier in filling the kiln, and these binders make a floor much better adapted for receiving these elbows and connections than the upper ends of the upper tiers of pipes. The practical use of this method of binding the pipes together has demonstrated that the waste from this source, which has heretofore been one of the most serious losses in this manufacture, is entirely obviated. So far as the writer knows the binders which have been described are the only practical remedy for this evil.

The pipes shrink in burning, so that the binders should, of course, fit loosely over the sockets when the kiln is set.

The kiln having been filled, the doorway is walled up with bricks and carefully daubed over with loam and sand, the fires are lighted and kept slowly burning for the first six or eight hours, after which time they are progressively increased for the next forty hours, making the total time about forty-eight hours for hard fired sewer pipes. If the stock has not been thoroughly dried before it is placed in the kiln, the time required to burn the pipes is, of course, longer. Kilns of this kind are commonly fired only a week, but they can be fired twice in three weeks if desired.

The burner determines the heat by directing his sight to the mouths and top outlet of the oven; when the heat is reached and before the fires burn hollow, the mouths are stopped up with ashes to prevent the cold air from cooling the oven too rapidly.

The salt glaze is the one commonly employed for earthenware drain pipes.

The process of glazing with salt is of ancient origin and it consists in throwing the salt into the kiln towards the end of the firing, and just before the highest heat is obtained.

Salt that has been used for preserving can be employed as it is not requisite that it should be pure.

The fires should be properly managed, and at the right temperature in a closed kiln or oven, the salt is thrown uniformly through the holes at the top of the kiln. Small, light scoop shovels are best for this purpose. The quantity of salt necessary for a moderate sized oven is 150 to 160 pounds. About one-half the quantity of salt having been thrown into the oven, the fire is momentarily increased, then reduced, and a few specimens of clay burned with the pipes for the purpose, examined. The remainder of the salt is thrown in, part at the top, and part regularly over the top of the fire.

The temperature of the kiln is so high at the "burning off," or end of the firing, that the volatile salt is at once converted into vapor, which intimately surrounds the pipes in the kiln and there is consequently a reaction of the vapor on the silica of the clay bodies.

The agent which promotes the reaction of the silica and common salt is the aqueous vapor which is always present in the flames of the furnace. The oxygen of the water produces soda with the sodium of the common salt, while the hydrogen combines with the chlorine, and is evolved as hydrochloric acid, the soda then enters into combination with the silica.

The glaze produced upon the earthenware pipes in the manner described is consequently a soda glass, and forms a very thin film or coating upon the material. It is of course manifest that the greater the quantity of silica a clay contains the more readily it will decompose salt, and the more lustrous will be the glaze produced. When it is desired to secure the brown color so common on drain pipes, it is communicated to the glaze by throwing such substances as birch bark into the fire during the glazing process, and the larger volume of smoke thus evolved produces the desired effect. It sometimes happens that the ware in some portions of the kiln becomes covered with salt, a part of which then appears as efflorescence.

After the kiln has been properly fired all the doors and openings are carefully daubed around with a mixture of sand and clay, a few air holes in the furnace doors not exposed to the wind being allowed to go unplugged for a few hours, and after two or three days the burned and vitrified sewer pipe is ready to be removed and shipped to market.

In the burning of drain tile as in the burning of sewer pipe it is essential that the tile should be thoroughly dry; the dryer the tile the better the success to be attained. The time, fuel and other items of cost, which have to be expended for the thorough drying of the tile in the kiln might just as well be saved if possible by utilizing the natural method of drying. The manner of setting the tile in the kiln is also an important item and the method employed varies with the various kilns in use. When the Dutch or open-topped kiln is employed, it is usual to set the small tile in the bottom of the kiln, the larger tile is then placed in the central tier, the smallest tile being placed in the upper portion of the kiln and in no case should the tile be allowed to come in contact with the walls, space of about one inch and a half should be left open all around the side of the kiln. When the up-draft or crown-top kilns are employed for burning drain tiles the method of setting is similar to that which has just been described, although it is found from experience that better results are obtained if the tile of largest diameter are set near the top. When the down-draft kiln is used for burning the drain tile it is desirable that the large tile should be set at the top, care being observed, however, not to place the large tile at the points of extreme heat. And in kilns of this character it is desirable that if there are any tiles which are not thoroughly dry that they should be set at the bottom of the kiln so as to obviate the necessity of driving the watersmoke from the damp tile through those which are dry.

The method of nesting the tile varies with different clays, some clays will allow close nesting, while other clays require to be nested very openly. No rule for nesting the tile can be laid down, the best method to be employed can be developed only from thorough knowledge of the practical qualities of the clay to be burned. In order to avoid the cracking and loss from improper nesting it is desirable, where defects of this character occur, that the cause should be thoroughly investigated and a memorandum made of the result upon the books at the works. If some such simple system as this could be adopted in the various clay works of the country and the result of the practical experiences could be brought out at the conventions, or recorded in the pages of the Clay-Worker, great good would result to the trade in many of its branches.

In firing the tile care should be observed not to push the burning too rapidly, only a light fire should at first be used in the fire-box; then the heat should be raised very gradually, fuel being added in smallest quantities as nothing is to be gained from pushing the burning of the tile in its early stages. The watersmoke must be driven off gradually but surely, until at last none of it can be discerned mixed with the blue-black smoke which issues from the top of the flues or stack. Patience worketh wonders in burning drain tile as in burning all other classes of clay products. Of course the dryer the tile the quicker the kiln may be burned off; but as it is not possible to have all of the tile of a uniform degree of dryness all the dry tile have to be held back until the moisture has been thoroughly driven from the damp tiles, otherwise crushing, cracking and other losses will result. Even after the watersmoke has been thoroughly driven off it is desirable not to push the burning too rapidly, increase the heat until the tile have been brought to nearly the melting point, and at this temperature the heat should be maintained for two or three hours; great caution, however, should be observed not to increase the heat to the actual fluxing point, for in such a case the tile would run together and the kiln prove a loss. With some clays, however, it will be necessary to maintain the final heat all the way from four to eight hours. After the kiln is burned off it should remain closed for about twenty to twenty-four hours, after which time it may be gradually opened and allowed to cool.

THE MEASUREMENT OF BRICKWORK

It is curious to observe how considerably the method of measuring brickwork varies in different parts of the country. In many localities, Philadelphia for example, the custom is to measure it by the number of bricks contained, but this system possesses a serious disadvantage. There is no uniformity in the size of bricks, and hence the size of a wall, which a given number of bricks will produce, is uncertain. When, therefore, the price per thousand for laying bricks is given, considerable trouble is involved in arriving at the cost for the whole of the brickwork in the building.

Probably the better plan is to measure by the dimensions as is common in several sections of the country.

The unit of measurement in this case is not important. The cubic foot or yard is employed to some extent, but the perch of 25 cubic feet and the superficial rod in brickwork one brick thick, are often used. Unfortunately the term "rod" has no very definite significance. Two hundred and seventy-two and a half feet super, and one and a half bricks thick, 16½ feet square or 272¼ square feet and one brick thick, 16½ square feet and 63 square feet, are all termed "rods." Under these circumstances it would probably be, of advantage if the cubic foot or yard could be made the standard unit of measurement for brickwork throughout the country.

It may be added that the number of bricks contained in any piece of built brickwork may be approximately ascertained by deducting one-tenth for the volume of mortar.—*A. S. J.*

Written for the Clay-Worker.

THE OLD CLAY PIPE.

BY MARGARET ANDREWS OLDHAM.

You may talk about your meerschaums,
your cigarettes and such,
And the new fangled smoking things
that be;
You may rave about your "antiques," with
jewelled treasures set,
But a clay pipe is good enough for me.

I have travelled o'er the wide world, and
smoked the spicy weed;
(But I left far behind my old clay stem);
I have smoked in all the fashions that
every nation set,
But I found little joy in all of them.

While the smoke would puff as freely, and
maybe with more style,
I would think that it wasn't just the
same,
So I'd shut my eyes and fancy that 'twas
just a whim of mine,
And the difference was only in a name.

But the smoke and smell were different,
as chalk and cheese, I'm sure,
For it clouded my brain and filled my
eyes,
And it caused a sad home-sickness that I
never felt before,
As I longed for the old clay pipe I prize.

So at length in desperation, I hastened to
my home,
And my seat by the glowing hickory fire,
In the cosy chimney corner, the calmest
spot on earth,
Where such calm is the heart's complete
desire.

And I seized with grateful longing, my
slighted old clay pipe,
Which I filled with the aromatic weed,
Oh 'twas then I fully prized it, with its
sweet and cleanly smell,
And it seemed just to fill my every need.

As the puffs of blue smoke gathered in
clouds about my face,
As they formed into pictures pure and
fair,
Then my brain and eyes grew clearer, my
heart was light and free,
For the old pipe bewitched the very air.

So I filled it as for hunger and filled it yet
again,
And as sweet childish faces, rosy-ripe,
With their lips and bright eyes smiling,
peered at me through the smoke,
I would say, "Bless the homely old clay
pipe."

You may prize your costly meerschaum,
with antique jewels set,
And the rarest you may find on land
or sea,
But I'd give them all most gladly for one
familiar puff
At the clay pipe, that's good enough
for me.

CORRESPONDENCE.

These columns are open to all. The full name and address is required but will not be published except when permission is given by correspondent. Those desiring to communicate privately with any correspondent whose full name is not given can do so by addressing letters care of Clay-Worker.

Paving Brick.

Editor Clay-Worker:

No doubt the manufacture of street paving brick is now receiving and has for the past two or three years received more attention than any other product made of clays. Yet the subject is in its infancy. It has, however, been sufficiently demonstrated to prove that brick make a splendid material for street pavements.

I thought that perhaps as good a thing as I could do would be to mention some of the leading places where street paving brick are made, that those who desire to investigate the subject further may do so or at least obtain some information of value; at the same time I shall take the liberty to make a few suggestions. You will find on the yard of T. B. Townsend & Co., Zanesville, Ohio, paving brick being made by the soft mud system, out of a semi-plastic fire clay. These brick are giving excellent satisfaction. Also at Middleport, Ohio, you will find them made from a good common red clay on a stiff mud machine. Both of these brick are being laid in the streets of Columbus, Ohio, the former also at Zanesville, and are giving excellent satisfaction. I heard some of the citizens of Columbus say that they preferred them to granite blocks.

Going toward the extreme Northwest, you will find at the works of C. J. Holman & Bros., Sargent Bluffs, Iowa, paving brick made from a very tough clay, as found in the bank, but when exposed to the atmosphere becomes very hard and difficult to reduce. This clay, in the bank, lays in layers of blue, gray, red and white stratas, with intermixtures of fire clay. Mr. Holman is now making a very good paving brick. When you go to see him, stay for supper and you will not regret your visit although you should fail, entirely, to see his brick plant.

Coming down to Lincoln, Neb., you will see the largest paving brick plant in the country. Stout & Buckstaff are making about 100,000 No. 1 paving brick per day, and have one of the most completely equipped plants I have ever seen. Their clay is a mixture of fire clay with very tough plastic blue and red clay. The strangest thing about this mixture is that nature has done its work. The paving brick clay lays about 12 feet below the top soil. It comes out of the bank in a moist condition and will not take water until exposed to the atmosphere for some time. It stands a very high temperature in burning (all clays should, to make a good paving brick). Messrs. Stout & Buckstaff have a contract for laying about 20,000,000 of paving brick in the streets of Lincoln this season. It will pay any one thinking of going into the paving brick business to go and examine this plant.

Mr. John Fitzgerald of the same place has a very fine clay and is making an excellent paving brick. Coming down to Atchison, Kansas, you will find Benning & Beattie making and laying paving brick in the streets of Atchison; they are also shipping large quantities to Omaha. The average Omaha man is slow to admit that this city is surpassed by any other in any of the things pertaining to the comforts of the human kind; but as to paving brick clay, they willingly submit to Atchison (and a little investigation would demonstrate many other cities her superior in this regard).

Down the river at Leavenworth, the Government is putting in a very good plant at the Soldiers' Home. I am informed that they have the latest improvements and that their clay is good. Crossing the river from Atchison you will find at St. Joseph, Mo., on the yard of Bernard, Patton & Co., a very fine plant being erected. They expect to have out their first kiln about the middle of June. Their clay is similar to that at Atchison and Leavenworth. You will find at St. Joseph a number of very enterprising gentlemen, with a complete equipment of the most modern improvements for making paving brick. From here take the Wabash road to Moberly, Mo., where you will find one of the best clays I have ever seen. If you meet with the courtesies I did, and no doubt you will, Mr. W. G. Little, the secretary, will take you in his carriage to the works, where you will meet Mr. James Sandison, the manager. Their clay is blasted out of the mines and when first exposed to the atmosphere presents a dark steel color and is almost as hard as stone (soft stone). Every layer that is exposed brings to view the imprints of numerous kinds of vegetation belonging, perhaps, to the "sub-carboniferous period."

This clay, unlike any other of the same character I know of, dries in the sun under a strong wind without the least signs of cracking.

I do not think a superior clay to this can be found anywhere. Of course the mining and preparation for the machine is very expensive but the toughness of the clay in drying and burning more than compensates for this. I will say, that here you will see a very complete plant. While at Kansas City call and see the Diamond Press Brick Co. They have an excellent clay for anything they desire to make from clays. They have samples of terra cotta that are fine. The clay in the bank is similar to many others, I have mentioned, but much purer than some of them. Most of these paving brick clays are short but the Diamond Brick & Terra Cotta Co. have a clay that is very long and tough, burns a very fine color. So far this is the only clay that has been found at or near Kansas City that is suitable for good paving brick. There are a number of other places where paving brick are being made but I am getting this letter too long.

Allow me to correct what I consider to be a wrong impression, that is, this: Many brickmakers think paving brick can only be made out of what is known as "shale." This, I think, is a mistake.

I know a number of plants that are making excellent brick for street paving out of common plastic clays. One thing, however, is required, the clay must stand a very strong fire in burning, without melting or twisting out of shape. For this reason many paving brick makers mix fire clay with common clay. Out of this custom or method the idea has grown, that to make a good paving brick you must have fire clay. I think the best paving brick that are now being made have no fire clay in them whatever. One word as to the preparation of clay for paving brick: Too many brickmakers have attempted to produce good brick without the proper grinding of clay. I find the better the clay is prepared the better the brick. You cannot get the clay too fine. The only thing I have seen, so far, suitable for what is known as the shale or soapstone or clays of that nature, is the dry pan. But for all plastic clays (purely plastic) I would use some kind of a roller crusher. I would like to say here something of brickyard construction, but time forbids.

"OBSERVER."

Questions About Drying.

Editor Clay-Worker:

Mr. Jno. W. Crary says in your May No.—"If clay will not stand sun drying it will not, as a rule, stand sufficient heat in burning to make a good brick." I would like to ask him through your columns if he means to say that a clay which will not stand sun drying, also will not stand drying without check cracking in some form of steam or direct heat dryer? And he does not treat of the results obtained from some of these dryers, which I know to be in successful operation.

I should like to hear from some of the owners and builders of patent dryers.

I have here a clay which cracks very much in our hot Montana sun and strong winds, but which I have proved by drying in a close room without *any* direct heat, comes out with no check cracks, and burns into a strong but light colored brick, while the same brick sun-dried or set directly in the kiln, comes out "shaky" unless indeed it be burned until vitrified. Advice on this subject, direct to me or through your columns, will be thankfully received. F. L. S.

Helena, Mont.

Wood as Fuel in Brick Burning.

Editor Clay-Worker:

The time is not very remote, when there was but one kind of fuel used in burning brick. Forty years ago, I believe I am safe in saying, there was scarcely any brick burned except with wood. And those in the old style out of door kilns. While to-day we use wood, coal, coke, natural gas, or oil, in permanent kiln walls, or improved-patent kilns, constructed on scientific principles.

Wood and coal, being more generally distributed over the brick manufacturing districts, are more largely used, and in all probability will be for years to come. When this country was in its infancy it was covered in a great part with a dense growth of forest, which usually occupied the best of our arable lands. Wood was then plenty, and every means was employed to rid the ground of this surplus timber; and among other things was the utilizing it so far as possible in brick burning. And even to-day in some sections where there are tracts of timber a little remote from a market, you may hear men speculating, and asking advice in regard to the matter, as to the advisability of using this wood to burn a kiln or two of brick.

They say I can't sell the wood and I have great lots of it going to waste; and I believe if I would use it up and burn a few hundred thousand bricks, I could sell them sometime even out here in the country.

And in many places where wood was less salable than brick it was the starting point of some of our prominent brick manufacturers, making available and profitable to themselves, their otherwise useless materials.

Wood, in most places, is being rapidly superceded by coal, wholly, or in part, and for several reasons—first, on account of its scarcity, which in turn makes it high in price.

Wood that has hitherto made the best fuel is no longer used as such because of its value in manufacture in various ways; where the trees were formerly cut entirely up into cord wood, of late years, the trunks and solid parts, are used as sawmill material, and the tops, limbs and inferior parts, together with dead or hollow trees, are cut into cord wood, so that no great quantity of first-class cord wood is available now, as formerly.

The comparative value of wood in comparison with coal, depends measurably upon the kind of wood, or the time it was cut, condition and quality generally.

The following table gives the value of wood as fuel compared with coal in weight:

One cord hickory or hard maple weighs 4,500 lbs. which is equal to 2,000 lbs. coal.

One cord white oak weighs 3,850 lbs. which is equal to 1,750 lbs. coal.

One cord beech, red oak and black oak weighs 3,250 lbs, which is equal to 1,450 lbs. coal.

One cord poplar, chestnut and elm weighs 2,350 lbs. which is equal to 1,050 lbs. coal.

One cord pine weighs 2,000 lbs. which is equal to 925 lbs. coal.

So it is safe to assume that 2¼ lbs. of wood equals one pound of the average quality of bituminous coal; and a pound of pine wood is worth about the same as 1 lb. of hickory, assuming both to be dry—and in brick burning it is very important that the wood be dry, as each 10 per cent. of moisture will detract that much from its fuel value.

Wood should be cut and seasoned not less than six months before using; and should be split into sections so as to be handled readily, and enter the arches without unnecessary effort or struggles of the fireman.

Where the wood is split or left in large ungainly knots, or forks of trees, firemen will usually work around them or away from them; leaving them on hand and in the way when done burning the kiln, and in this way a large lot of worthless wood is liable to accumulate.

Sometimes wood that is cut and "ricked" up in the woods, remains there for a term of seasons and deteriorates very much in value as a fuel. It may be the trees were of a variety that have no lasting-quality and the sap portion of the timber is soft and spongy, and rots easily. Such wood makes but little heat, by producing but little flame, and is no more than a smoldering bed of coals. The same would be true of other varieties of timber cut at the wrong season of the year, as then the worms would have so eaten and penetrated all the sap portion beneath the bark as to render it worthless. If the fuel is good the intelligent burner knows it; if it is not he must work accordingly. Any of the free burning woods—sound, hard and dry, is what is needed for fuel when you use wood. But do not expect your burner to do good work with green wood, or that which is sap rotten, or sour, heavy stuff that will not burn free in any condition, or a lot of small twigs and brushy stuff that may have been imposed upon you as cord-wood. As a rule, brick can be burned at the rate of two thousand to the cord of wood, and the man who makes from one to four million bricks annually, has a very grave problem before him in the early spring months. He must have his fuel on the yard at all times, when he does not need it as well as when he does, and many times during the season will find him short of fuel and a kiln hot. Some of the old brickmakers will smile and say: "I have been right there myself."

And again, wood is a bulky fuel, it occupies too much space that in most yards is valuable, and on account of its bulk and inflammable character must be kept at a reasonable distance from burning kilns. This necessitates much re-handling, which is expensive.

Now consider the bulk of wood necessary to burn four millions of brick at the above estimate: It would require a "rick" of wood four feet wide, eight feet high, and a mile and a half in length. This is only a reasonable, approximate estimate—some will say too much and others not enough—and is based on experience and observation among the brickmakers over a wide extent of country. I hear it frequently stated that there is a great difference in the burning or refractory properties of clay. But I find a greater difference in the fuel value of wood from one pile to another than I do in the clay banks from one yard to another.

The woods of the Northern states are harder, tougher, and of more lasting quality, and make better fuel, as a rule, than the timber of the South, excepting only the rich, fat pine of the Southern states. Taking varieties as they run, white oak, beech, maple, hickory, post oak, ash, etc., and the growth is a hard, tough timber, making a lasting fire, while the native woods of the South, many of them are among the soft woods or lighter timber, such as soft maple, cottonwood, magnolia, cypress, cedar, chestnut, elm, sweet gum, etc., among the varieties of oak and hickory the timber is not so dense or lasting in its quality as a fuel. Over a great portion of the Southern states there is an abundance of good pine, but like all other sections where brick are most in demand the timber is getting scarce, and first-class pine cord-wood is scarce—and pine wood can only be had from the second growth timber, designated "old field pine."

Brix.

City of New Castle, Pa., and Other Things.

Editor Clay-Worker:

The City of New Castle is beautifully situated between or among hills in the Shenango Valley at the mouth of the Shenango and Mehannock Creeks, in the county of Lawrence. We have six blast furnaces, one rolling mill, the largest wire nail mill in western Pa., a large sheet mill and a wire rod mill being constructed and a new steel plant about to go up. In fact, we have a great many advantages here that other towns of this size have not got. Population, fifteen to twenty thousand. Lawrence Co. has long since been noted for its minerals.

The face of my clay bank is 25 feet. I run my cars into the bank, load the clay into the cars, haul them out without locomotion. The striping I use for red brick. I make paving, red, fire and shape brick, besides furnishing a large trade raw and ground fire clay. Capacity, 20,000 per day of 10 hours. I have lately put in a Centennial Machine which gives entire satisfaction. I sell my fire brick to all the farmers and mills around and they say that they can't be beat. I believe that I have the best common clay that I ever saw and I have seen a good deal of it. Since the best way to test the pudding is to eat it, my clay has been tested. I am furnishing clay to-day to parties who have been getting from me for 20 years back—so much for quality. Out of curiosity, I had some of my paving brick tested for strength. I took four brick and they went away above other brick that were tested by the same parties. I won't give figures here. In Frey, Sheckler & Hoover's catalogue they quote from a party on the Ohio River stating that he can make brick at $2.55 on cars. Now I think any man or men that put such figures to the public can't figure or are not long destined to run before they are in the hands of the sheriff for. I can do 2,000 brick as cheap as the next one and it costs me every cent of $5.09, and the way I am situated I can do it much cheaper than a great many. What do others think in regard to cost?

I turn out some very fine brick. Hoping to write you soon again, I am,

Yours, M. S. Marquis.

Drying With Crude Oil.

Editor Clay-Worker:

I should have been glad of an opportunity to revise the paper published in your May number. It was written 16 months ago and in this age of improvement and development that length of time may cause one to change his mind. For instance in regard to dryers, I said in January, 1888: "I am a decided advocate of artificial circulation to bring artificial drying to a point anywhere near perfection." I now say that from my experience during the past six months, I am satisfied that as good results can be obtained with a natural circulation as with fans. I have one dryer in which I use crude oil as fuel. This Dryer is constructed almost exactly as the first one I ever saw, which was invented by J. K. Caldwell, then of Philadelphia, now of Minneapolis. It has a flue or chamber beneath the cars the whole length of a 90 foot tunnel, with a cross flue at the rear end connecting with a stack, and uses radiated heat only. The great objection to this dryer, with coal as a fuel, was that the flue, or chamber, would clog up with soot or ashes. With oil this is entirely obviated. I have always lamented the supposed necessity for carrying the steam or evaporation from the front to the rear of a tunnel dryer and in the one now being described, the evaporation is taken off by a six-inch sewer pipe over each car running through the roof of the dryer. To those who have never tried this plan I think the results will be astonishing. I am aware that most clays need to be dried much slower than ours and to those preparing to dry artificially, I say, as indeed I do to all preparing to experiment at all in brickmaking, burning or drying—*"Go slow."* I am still enthusiastic in commending oil as a fuel and am now changing my boilers to adapt them to oil. I wish, however, to correct my figures a little, after using oil a year and a half. The saving is less than 20 per cent. over wood and coal but with better results and less waste. In my description of my dumping track I should have given the credit for this valuable improvement to B. W. Blair, of New Richmond, O., who not only suggested it but sent me a model which was faithfully copied. It is a great saving of cars and we really empty the car quicker than by the old way. The fad of our Chicago brickmakers at present is, pulverizing the clay in the clay hole. Several different plans are being tried and the results will be given in detail at the annual convention in Philadelphia. D. V. P.

Chicago, Ill.

Shrinkage and Expansion of Clay Under Heat.

Editor Clay-Worker:

I desired to correct one of your able contributors, who says that all "clay will shrink in burning, and that the common brick burner knows that his kiln must settle, but he don't know why." I would like for the learned professor to come "South" and see me. I can show him and tell him of many of our "clay fields," containing clay that will not change size or shape by any kink of furnace heat. Indeed some of our clays produce a brick that *swells* a little when burned very hard. Furthermore, I can tell the gentleman, that there are clays at the North, that will not shrink or fuse in burning, and if he will attentively read my article, I will show him more than his scientific researches have taught him, about clay and brick. I am old, but in no sense a *"Fogie,"* I have always aimed to be in advance of *my "craft"* and don't look back, if I can see my way clear ahead.

I have never burned brick with gas—in the form now used in your state, but I have experimented with coal oil and clay long before gas was thought of for burning brick, and I hope soon to offer the trade an excellent invention for using coal oil or petroleum in burning brick. I have also a very simple and cheap kind of a kiln for the continuous burning of brick, and the utilizing of the exhaust heat of a kiln, just after it has been *closed.* I tried one kiln in common clay for red brick and it was successful.

As soon as I can secure letters patent on my inventions I hope to present to the craft, through the Clay-Worker, full description of my kilns. They are so simple I think they will commend themselves to all practical brickmakers.

J. W. CRARY.

PRESSED BRICK MAKING

Near Petersborough, England.

Editor Clay-Worker:

Thinking that your reader might be interested in hearing something more, as to the work of pressed brick making in England, I send you the following extract from an article written by myself, which appeared in the *London Building News* of recent date:

COST IN DETAIL OF MAKING PRESSED BRICK.

PIECEWORK.	Per 1,000 Bricks. £	s.	d.	Cost per 1,000 Bricks. s.	d.
One man oiling the machinery and cleaning up generally	0	0	3½		
Three men getting and loading "knot" clay into wagons	0	0	10½		
Two youths shunting wagons ready to be hauled up by engine	0	0	6		
One man attending perforated bottom grinding pan	0	0	3½		
One youth feeding hoppers above machines with ground knots.	0	0	1¾		
Two youths lifting bricks from machines to presses	0	0	3		
Two boys lifting bricks from presses to barrows	0	0	2¼		
Three men wheeling bricks from presses and setting in kiln	0	0	11		
Three men drawing kiln and loading bricks into wagons or carts, or stacking on ground	0	0	9		
Allowance to engine-driver extra to wages	0	0	0½		
				4	3
DAY-WORK.	Per week.				
Two men—Hoffmann kiln burners—at 30s. per week each	3	0	0		
One youth wheeling smudge, coals, and sundry work	0	12	6		
One man—engine-driver	1	6	0		
One youth—fireman and sundries	0	12	6		
One man—dry material man and sundries	0	15	0		
	6	6	0	1	7
				5	10
Each set of semi-dry machinery averages 80,000 bricks per we'k. Thus, £6 6s. equals 1s. 7 d. per 1,000.					
Coals for engine fuel—the engine drives plastic machinery as well as semi-dry, so it is but fair to charge a proportion	Per 1,000 0	0	7½		
Oil, Etc., for engine	0	0	1		
Brick oil	0	0	0½		
Coals and smudge for burning bricks in the Hoffmann.	0	1	0	1	9
				7	7

The above price is only the prime cost, and does not include wear and tear, rents, rates, taxes, interest on capital, etc., etc.

£1 equals $4.84. 1s. equals 24c. 1d. equals 2c.

Note.—40 bricks per thousand allowed for waste—*i. e.*, every 1,040 bricks counts as 1,000.

These pressed bricks are made from shale, which in this district is known as "knots," and it is found immediately below a bed of plastic clay. This shale requires no previous preparation, it is in its natural state in the clay pit, got, loaded into wagons, hauled up by the engine, tipped into the perforated-bottom grinding pan, ground, raised by an elevator, fed into the hoppers of the machines, made into bricks, pressed, loaded on barrows, wheeled to, and set in the kiln ready for steaming and burning in less than ten minutes—no sand, or any other mixture, is required; all that is wanted is, in very wet weather, a little dry knot clay itself thrown in the pan when it clogs. Winter does not stop the manufacture; unless the weather is exceptionally bad, the bricks can be made every working day in the year. The last two bad brickmaking seasons suited us admirably—the worse the weather the better for us, because we can go on, and it stops the hand and plastic yards, and we get a better price in consequence; for instance, one large Kent, Essex, and Middlesex firm of brickmakers made 15 millions below their average last season, and the pressed yards never did better. All our stock of bricks has gone, and we are now sending away something like one hundred thousand bricks per day.

Another great advantage is, being able to make special sized or special shaped bricks in half the time other yards can; for instance, within an hour after receipt of an order, a portion of the bricks can be in the kiln, and in fourteen days loaded into trucks and on their journey to the customer.

The bricks sell freely in the London market, they are of good shape, and require little trouble to lay.

Orders are coming in freely, and the makers have orders for some considerable time ahead.

The great secret of all this is, our "knots" is a material that will stand grinding, quick drying, contains a great portion of natural fuel, and takes but little coal to burn.

A strike or ring in the coal trade would be a fortune to us, because we can burn our bricks for so very little money; it would pay us to go on making when the increased price of coal must close other yards.

The knot clay also, when ground, makes drain pipes and roofing tiles.

The bricks made are of three sizes—9 in. by 4⅜ in. by 2⅝ in.; 9 in. by 4⅜ in. by 2¾ in.; and 9 in. by 4⅜ in. by 3 in. Latterly bricks 3¼ in. thick have been manufactured, and it is probable that bricks even 3½ in. thick will be commonly made.

There is no loss from exposure to the weather, the bricks being stacked direct from the machinery in the kilns.

FURTHER DETAILS OF THE BUSINESS.

As to machinery used:—

The knot clay is got and loaded into small tram wagons containing three-quarters of a yard each, hauled up by a chain by the engine, and tipped into a 9 foot perforated bottom pan—i. e., the pan itself is 9 feet in diameter, not the outer frame. Each complete pan has a top pan and a bottom one called a saucer—the top pan revolves and has a perforated bottom, the bottom saucer is fixed and has a solid bottom—the rollers are fixed, revolve on their own axles caused by the friction of the revolving perforated bottom pan—fixed scrapers are in the top pan to guide the clay under the rollers—after the ground clay drops through the perforated pan it is pushed by lower scrapers into a boot formed in the saucer and is lifted from this boot by bucket elevators (on a leather revolving belt) to a stage above the machine hoppers—a boy feeds these hoppers and the bricks are shaped in the cylinder of the machine, delivered on a board ready for putting into the press. A 9 foot pan, 1 elevator, 2 machines and 2 presses will make 16,000 English sized building bricks in 10 hours, but take the whole year through 80,000 bricks per week. As a rule pressed bricks, and plastic wire cut bricks are made at the same time in the same yards, a 35 h. p. horizontal engine is used and it drives both sets of machinery.

The kilns used are what we call Hoffmann's but they are not like Hoffmann's patent, that is, one continuous arch all round, but are a series of arches each 14 feet wide in the clear. Each kiln consists of 14 chambers, six 24x14ft. on each side, and two end chambers 13 feet long by 14 feet wide. The chambers are 4 feet high from floor to springing and 8 ft. 6 in. high from floor to under side of arch. The 12 larger chambers hold 16,000 bricks each, the two smaller chambers 8,000 bricks each. The smoke chamber is surrounded by the brick burning chambers and is 10 feet wide in clear. The chimney stack is 120 feet high above ground level. Each chamber has a separate flue and has two openings into it in about the center of the floor and one opening in the external wall. Each chamber flue has a valve into the smoke chamber, which valve is opened and shut by a rod on the top of the kiln. The external walls are 1 ft. 10½ in. thick, the division walls 1 ft. 6 in. thick, the smoke chamber wall 3 ft. thick. The kiln is tied together with railway rails laid horizontally and vertically and the vertical rails are again held in place by iron rods across the top of the kiln. The division walls between the chambers have each 6 openings, 8 inches wide by 2 ft. high to let the fire through.

Now as to coal:—

In the arch of each large chamber there are 25 feeding holes (closed by cast iron pots) through which smudge is fed. In the doorway of each chamber is built a temporary fire hole in which coal (nuts) is burnt. There is three times the weight of smudge burnt to one of nuts. Smudge costs 7 s. per ton, nuts 9 s. per ton—but bear in mind *a ton of COAL* or *smudge* is 2,352 lbs. weight and not 2,000 as in America. We get what is known as "Colliery weight," i. e., 21 cwt. to the ton.

For the information of your readers generally and your contributor, Mr. Alfred Crossley, in particular, I send you the analyses of our knot clay, made by Michael Scott, F. R. C. E., in 1881.

ANALYSES.

Alumina	1.50
Silicious insoluble matter	66.80
Iron	4.95
Lime	5.10
Magnesia	0.20
Alkalies	Traces
Combined water	6.60
Carbonic acid	4.00
Sulphur	1.28
Carbonaceous matter	6.50
Oxygen and loss	3.07
	100.00

N. S. BLUCK.

Woodstone Brick Yard,
Petersborough, England.

New York News.

Editor ClayWorker::

The building season is well under way and competent experts acknowledge that fully two-thirds more buildings are to be erected in this city this year than were put up last year. Almost the same condition of things are reported from the suburbs, the extensive building operations being by no means confined to Manhattan Island. Beyond the Harlem River there is unexampled activity on the part of those who want small and comparatively cheap homes and the capitalists find the erection of those edifices remunerative. In the eastern district of Brooklyn and at Bay Ridge, at Staten Island, Bergen Point, Baymore, Greenville, and Jersey City Heights—in fact within a radius of 30 miles of New York the building fever—and a legitimate one—has made itself felt, and the brickmakers are sure to feel the impetus.

At the present moment, however, the brick market itself is dull, and the price, which had been well sustained up to that time, fell about the 2d of May $1.00 a thousand or from $6.25 to $7.25 for Up-Rivers and Best Haverstraws. The reason for the break was very simple. Toward the latter end of April we had almost a week of miserable, rainy weather, and from the 29th of that month to the 2d of May the celebration of the Centennial of the Inauguration of Washington stopped all business here and hereabouts. The two events produced a complete cessation of labor—no brick whatever being laid in the walls—and as the barges from the brickmaking districts continued to come in, and were not unloaded, there was soon a glut in the market. At one time 54 barges containing 12 million of brick were lying idle at our docks. By degrees this amount melted away to 4 millions, and as we are now being favored with excellent weather, it is hoped that matters will soon run along in their regular rut and that prices will bound back to their customary condition.

Among the new buildings projected during the month was one for offices to be erected at the corner of Williams and Beaver streets by the Farmers' Loan and Trust Co. It will be of brick, eight stories in height, and will cost $425,000. Another office building is projected for the corner of Wall and Broad streets, a handsome synagogue of buff brick with Euclid Stone trimmings, is to go up in 112th St., and a scenic studio is to be erected at Walton Avenue and Cheever Place, four stories in heighth.

W. K. Hammond, the popular brick commission merchant of this city, has taken the Crossman property at Cold Spring Harbor, L. I., and begin the manufacture of first-class brick there. Four Weill machines are now running steadily, a force of 100 men is employed, and Mr. Hammond expects an output this year of 8 millions.

The brickmakers and dealers were not behind hand when the call for help came from the stricken district in Pennsylvania. The sum of $1,000 was sent by the Building Material Exchange to the Johnstown sufferers, and individual help came every day.

Work at the brick yards at Verplanck's Point began on May 16th, and is going steadily forward. There is no prospect of any more strikes.

The new *World* Building in this city is to rival that of the *Times*. It will be finished in the fall of 1890, and will be 13 stories in height, surmounted by a dome. Stone will be used in the construction of the two lower stories, while those above will be of brick and terra cotta. The building will be devoted mainly to offices. BRIC-A-BRAC.

THE AVERY STAMPING CO.

The Avery Stamping Co., of Cleveland, O., successors to the Avery Elevator Bucket Co., of the same city, have lately purchased of W. H. Caldwell, of Chicago, Ill., (the patentee and manufacturer of the celebrated Caldwell Steel Screw Conveyor), his patents for Corrugated Elevator Buckets and other sheet metal goods, whereby any article manufactured from sheet metals may be made stiff and rigid, thereby doing away with cross braces, that are found in the old style Elevator Buckets, and which interfere so with the filling and emptying. This corrugation will be a great benefit and improvement, especially in Elevator Buckets, as ear corn, slag, or any rough or ragged material can be dipped up easily, with less friction on a full load, as there are no braces to catch or seams to give away, that cause spilling material down the back leg, as all elevator men well know, braces retard the emptying of Elevator Buckets.

This bucket will make a great saving in time, labor and expense, while doing twice as much work as buckets heretofore used. For large Elevators, as in Chicago, Buffalo, Duluth, and in many of the other principal grain ports, where speed and quick work is especially desired, this new bucket will take the place of the old style now used. They will be made of steel, perfectly seamless, without rivets, solder or seams, any parts of which are so liable to give away. Another great feature is, that they will not be expensive in price, and will outwork three of the ordinary buckets now used. The sizes will be 10x5½; 11x6; 12x6½; 14x6½; 16x6½; 18x7; and 20x7, made of suitable gauges of steel, giving them with the corrugation the full strength and stiffness desired. These buckets will be considerable lighter than the common ones now used, while they will be much stronger, and parties interested in improving their mills and elevators, desiring samples and prices, can have same by applying to the Avery Stamping Co., or any first-class mill furnisher or mill-supply house, as our goods have a world-wide reputation, and every mill furnisher can furnish same. Freight rates on our buckets are fourth class, while other makes are first class, again a great saving to the buyer.

N. B.—Please bear in mind that we have the only patents ever granted in the world for Seamless, Drawn, Stamped, Pressed and Forged Elevator Buckets, also the only patents ever granted for corrugating buckets, troughs, etc. On small sizes of our Elevator Buckets, taking the weight, boxing, cartage, freight into consideration, it is advisable to ship by express as far as possible, to secure prompt receipt of goods.

THE LION BRICK PRESS.

Editor Clay-Worker:

While enjoying a very busy time of it this season on our Lion dry press, we are often confronted with the remark: "Your press is rather expensive, we can buy other presses for less and are promised the same results."

Without going into the merits of these 'promises" we want to place a few figures, before your readers and leave the inference to their good judgment.

Certainly the cost of a plant is to be considered and wants to be in harmony with one's purse, but where there is sufficient capital, the main questions should be: How efficient will the plant be?—How economically will it work?—And will its product be in proportion to the investment?

As to efficiency let us compare dry presses making 5, 4, 3 or 2 bricks on a basis of 8⅓ revolutions, such as our Lion is gauged to, per minute. The output for 10 hours will be:

On a 5 brick press (the Lion)	25,000 brick.
" " 4 " "	20,000 "
" " 3 " "	15,000 "
" " 2 " "	10,000 "

But if we consider the above referred to 'promises" of an equal output per day, the table would be thus: A product of 25,000 in 10 hours would necessitate

8⅓ revolutions per minute for 5 brick press.
$10\frac{5}{12}$ " " " " 4 " "
$13\frac{8}{9}$ " " " " 3 " "

The former table leads us to the question of economy and it is beyond dispute that in steam employing machinery the most productive appliances are the most economical, within such a limit, however, as not to increase the help directly connected with it, which in this case refers to engineer (pressman), fireman and feeder. The second comparison suggests the question of quality and considering the importance of making a dry pressed brick as slowly as possible, a glance at the figures will show where the best quality may be expected.

It is not quite as easy to establish comparative tables on pressure, as the means to procure it are not alike; the toggle joint, however, is principally employed and in the case of the Lion is augmented by a lever, whose proportions are as one to six, multiplying the pressure exerted in the toggles, giving 200 tons pressure in the rams, produced by only about 33 tons in the toggle, at the same time securing equivalently less wear on the bearings. The weight of the Lion, 22 tons, (a cut of which appears on page 372 of this Journal), heads the list and is a safeguard against breakage.

Critical readers will easily judge whether a press with such assurances of success in its very construction is "expensive" or not.

Our aim is to cheapen the *running expenses* of a yard and not the first cost of the press.

ST. LOUIS IRON & MACHINE WORKS,
St. Louis, Mo.

Literary Note From the Century Co.

Mr. Joseph Jefferson has been engaged for a number of years upon his autobiography, which will soon begin to appear in *The Century*. No more interesting record of a life upon the stage could be laid before the American public, and Mr. Jefferson's personality is perhaps more sympathetic to the people of this country than that of any other actor we have had. He is the fourth in a generation of actors, and, with his children and grandchildren upon the stage, there are six generations of actors among the Jeffersons. The record which he has made of the early days of the American stage is said to be peculiarly interesting, especially the story of his travels as a boy in his father's company, when they would settle down for a season in a Western town and extemporize their own theater.

The autobiography will begin in *The Century* during the coming autumn, and the installment will be illustrated with a portrait gallery of distinguished actors.

THE CLAY-WORKER

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☞Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES furnished on application.

Correspondence on all subjects of interest to Clay Workers is solicited. Communications from practical men will always be welcome. Address all communications to

T. A. RANDALL & CO.,
14 & 16 S. Tenn. St., Indianapolis, Ind.

TESTS OF BUILDING MATERIAL.

We are indebted to Mr. Murrell Dobbins, of Philadelphia, for a copy of the official report of the U. S. Ordnance Department of the results of tests made by the latter, by request, of material used in the construction of the new Philadelphia City Hall.

We think the following extracts from the report will interest many of our readers:

(Pressure per sq. in. sectional area)

Marble Block from Lee, Mass., size 5″.90x5″.91x5″.90½, sectional area 34″.87, ultimate strength 20,504 lbs.

Marble—Montgomery County, Pa., size 6″.40x6″.35x6″.02, sectional area 40″.64, strength 11,470 lbs.

Sandstone — Hummelstown, Pa., size 6″.45x6″.40x6″.04, sectional area 41″.28, strength 12,810 lbs.

Limestone — Conshohocken, Pa., size 5″.92x5″.85x5″.92, sectional area 34″.63, strength 16,340 lbs.

Dobbins Machine-made Hard Brick—Philadelphia, size 2″.04x3″.86x8″.68, sectional area 33″.50, strength 8,610 lbs.

Hard Brick — (Excelsior Machine), 2″.04x3″.68x8″.53, sectional area, 31″.39, strength 8,310 lbs.

J. R. Huhn Hard Brick, hand-made, (pavers)—Philadelphia, Pa., 2″.05x3″.90x 8″.11, sectional area 31″.63, strength 18,690 lbs.

Dotterer Pressed Brick, (machine)—Philadelphia, size 2″.25 x 3″.98 x 8″.30, sectional area 33″.03, strength 7,770 lbs.

Sandstone Buff—Ohio, size 6″.03x6″.52 x6″.03, sectional area 39″.32, strength 6,510 lbs.

Limestone—Indiana, size 6″.45x6″.40 x6″.01, sectional area 41″.28, strength 10,620 lbs.

Sandstone (blue)—Ohio, size 6‶.25x 6‶.35x6‶.01, sectional area 39‶.74, strength 12,420 lbs.

Dobbins' Hard Brick (machine)—size 2‶.04x4‶.04x8‶.68, sectional area 35‶.07, strength 11,720 lbs.

Dobbins' Hard Brick—machine (one corner broken off before test)—size 2‶.05 x3‶.97x8‶.50, sectional area 33‶, strength 9,210 lbs.

Excelsior Hard Brick—machine (made from dry clay)—size 2‶.05x3‶.85x8‶.45, sectional area 32‶.53, strength 5,790 lbs.

J. R. Huhn Paving Brick (hand-made) —Philadelphia, size 2‶.03x3‶.90x8‶.05 sectional area 31‶.4, strength 20,830 lbs.

J. R. Huhn Hard Brick (hand-made) —Philadelphia, size 2‶.04x3‶.98x8‶.20, sectional area 32‶.64, strength 11,150 lbs.

JUDICIOUS ADVERTISING.

One of the puzzling problems in business is, how to advertise judiciously. That there is money in the right kind of advertising, there is no question. The fact has been demonstrated over and over again in the history of so many business men. But how to get the best results in advertising is *the* question; how to reach the greatest number of those that are likely to become interested in a business way, in proportion to the number reached. The trade journal that has a good circulation among those that it is desirable to reach has the advantage over publications of large general circulation. To illustrate: A daily paper may have a circulation of 30,000 and a trade journal have a circulation of 10,000 —the latter will probably reach ten times the number of desirable parties. Indeed we believe the difference is much greater. A daily paper having 100,000 circulation is not likely to reach more than one in every thousand that would be interested in a business way in clay working machinery. The trade publication with one-tenth of the circulation would reach in all probability ten times the greater number of parties likely to be interested.

The publication having the largest circulation would probably charge a proportionate higher rate of advertising, or if special rates are made they would likely exceed by far those of the trade publication, while in fact the latter would be worth ten times more than the paper of general circulation.

But suppose that the shrewd business manager confines his expenditure of money to trade papers in his line, how is he to tell which of several trade papers will give him the best return? Or must he patronize all? Publishers of trade journals are likely to represent that they cover almost the entire field, and they may think so. The most enterprising publishers *will* cover almost the entire field. They are enterprising, have the snap, get there on time, and allow no expenditure of money to stand in the way of getting to the front. Prompt business dispatch must go far to aid in determining where to put paying advertisements. It matters little what may be claimed, it is an easy matter to claim much, and have but little.

A publication of commendable proportions (not in our line) claims 10,000 circulation, and delivers one entire issue in three mail sacks—this same publication has a fair advertising patronage. The publisher depends largely upon his own representation and low rates of advertising to keep going—will take ads. at almost any price.

The shrewd business man that will closely watch the business methods of his trade papers will need no great length of time to determine where to put the bulk of his advertising patronage. One excuse after another may be offered to allay suspicions, but the truth is, that the enterprising publishers get there, and that too in a business way.

After having satisfactorily determined as to the medium through which to advertise, the next point of vital importance is, how to advertise so as to attract the notice of the greatest number, and favorably impress them.

A shrewd business man in starting what is now a very popular publication in New York City, took one entire page of the N. Y. Daily Herald for one week to announce in a dozen words the time when the first number of the proposed publication would appear, at enormous cost. A friend meeting the proprietor of the publication asked, "Why this waste of money?" The proprietor replied: "Did you see it? "Yes, I couldn't see anything else," was the reply. "That answers your question," and turning on his heel he walked on. The proprietor years after said it was the best investment he could have made with the money. It is not so much the cost, which may be considerable, but to catch the attention of those desired, and then in a business way make the representations good. Once in the field with the attention of the trade favorably directed—keep yourself there by shifting the scenes from time to time as it may be necessary, to keep the eye of the trade on the alert for any advance you may make.

It is a business mistake that has cost many a good business man his fortune, to drop his advertising because "trade is a little dull." Some other one having the tact will take advantage of it and occupy the field in the lull of the trade battle and have all eyes turned upon him when the return of activity comes.

Once to the front, hold the ground steadily and actively with good business methods and articles of merit, success is assured.

PAVING BRICK VERSUS ASPHALT PAVEMENT.

The use of vitrified paving brick for the pavement of streets has had such a rapid growth in many of the cities along and near the Ohio valley and in the towns and cities of Illinois, Iowa, Nebraska and Kansas that asphalt pavement manufacturers have become alarmed. To discredit the use of paving brick it has been charged by the *Manufacturer* that an agent by the name of Grant has been paid a goodly sum by asphalt companies to visit various cities and write down the use of paving brick. Further, the *Manufacturer* makes the statement that $400 was offered a member of the city council of a certain city if he would 'work" his council in the interest of asphalt.

The correspondent above referred to, purposely mixed up fire and paving and common clay brick and otherwise made gross misrepresentations of the facts. A special effort has been made to drive out the use of vitrified brick in the State of Nebraska, the city of Lincoln having contracted to lay over 17,000,000 the present season. It is further charged by the *Ohio Valley Manufacturer* that the papers that have published these reports have received the large usufruct in the transaction.

No amount of such venality will drive the use of vitrified paving brick out of the market to give place to asphalt. We have in this city (Indianapolis) a sample of asphalt, laid only last November, that has required quite a good deal of repairing up to this date and there are holes wearing into it that will require further repairs. The few warm days in May made the surface so soft that the tracks of heavy vehicles may be easily traced by the grooves, and the strong probability is that when the thermometer mounts up into the nineties that the surface will run, or become so soft as to inconvenience the travel. This pavement was laid at a heavy expense and it is evident that it will require much in the way of repairs while it is in use.

The manufacturers of paving brick have little to fear if they will see to it that good pavers are used in the construction of pavements.

THE U. S. STATISTICAL ESTIMATE OF BRICK AND TILE.

"*Brick and tile.*—Value, $48,213,000. These figures represent only a small gain over 1887. This is due rather to increase in the number of manufacturing plants than to increased production at the older and more important sources of supply; in fact, many of the latter show a falling off in production. Prices also were generally somewhat lower than in 1887."

The above estimate, in our judgment, is much below the actual product for 1888. It is very difficult to get anything like a full report. That there has been a very considerable increase in the past year—more at least than the above estimate, is apparent to us when we take into account the many new plants that have been established and the plants that have been enlarged. No certain estimate can be made, however, until the returns are received from the Census reports for 1890.

THE WORLD'S EXPOSITION, PARIS.

We expected to present in this issue a letter from our correspondent in Paris touching on the matters of interest to our readers in the great World's Exposition now in progress in that city. Owing to the failure of many exhibitors to complete their displays by the opening day the matter has been delayed.

The Exposition is a vast affair and in due time we hope to lay before our readers an account of the clay working machinery exhibited, if there is any.

The Clay-Worker may be found on file in the educational section of the Exposition which is in charge of Prof. C. Wellman Parks, of the Troy Polytechnic Institute.

For experienced workmen or desirable situations, cheap second-hand machinery, etc., etc., read the "For Sale, Wanted, Etc.," columns.

EDITORIAL NOTES.

Jno. S. Leach, of Muncie, Ind., desires information relative to the manufacture and use of tile for irrigation and would like to correspond with parties informed on the subject.

R. B. Morrison & Co., Rome, Ga., have favored us with a neat four-page circular dwelling on the merits of their Improved Kilns for burning brick and tile, which are proving very successful wherever introduced.

W. G. Halsey, of Galveston, Tex., writes that there is a fine opening there for a practical brickmaker with a little capital. There is an abundance of good clay and cheap fuel, and a good market. Mr. Halsey will be pleased to correspond with anyone desiring further information.

The Avery Stamping Co., of Cleveland, O., have favored us with a neat little book, being a calendar, diary and memorandum combined. It is intended for traveling salesmen to whom it will prove especially convenient and handy. Any traveling man can secure a copy by addressing the above firm.

Senor Ricardo Calvo, Fabricante de Ladrillo, Bogota, South America, writes that he is much pleased with the brickmaking machinery illustrated in the Clay-Worker and will probably purchase an outfit. He especially desires information as to the best methods of handling brick from machine to clamps, and will be glad to receive catalogues of conveyors and elevators.

R. A. Speed, Pres. National Brick Mfrs. Ass'n, writes that the brick interests of Memphis are in a flourishing condition. The trade has been very active but the probabilities are that the demand will drop off considerably during the summer months. The Memphis Manufacturing & Brick Co., of which our friend Speed is Secretary, have made nine million bricks this season and if the market requires them will make twelve million more.

R. Melvin, of Chaska, Minn., writes that for some unknown reason he has failed to receive the Clay-Worker of late and adds: "Please look it up and send me recent issues. I don't like to miss a single number. Though I have been engaged in clay work for twenty-five years I find I can still learn much from the Clay-Worker. It not only affords me pleasure to read it but it is a real help to me in business."

EDITORIAL NOTES and CLIPPINGS.

Sheboygan, Wis., is to have a pottery.

Vallejo, Cal., is to have a large brick yard.

J. L. Corder will build a brick yard at Bland C. H., Va.

Jno. W. Fowler, of Laurens, S. C., will urn a brick yard.

W. B. Thornton may build a brick yard at Conehatta, Miss.

A brick yard is to be built at Tazewell C. H., Va.

M. F. Wharton, of Troy, Ky., wants a good, reliable, experienced brick burner.

The Andrews Trip Hammer Brick Co., of Denver, Col., has been incorporated.

E. A. Face will make brick at Mammoth Spring, Ark.

James Townsend will erect a tile factory at Okolona, Ark.

Jno. A. Scott, brickmaker, of Meaford, Canada, has made an assignment.

L. B. Skinner, Dunedin, Fla., wants to purchase a roller clay crusher.

Geo. Sackford has started a brick and tile factory near Tipton, O.

Wm. P. Davis is thinking of going into the brick business at Packmart, Ga.

J. R. Martin is thinking of starting in the brick business at Denison, Texas.

Lynch Bros., Scottdale, Pa., want to buy a clay crusher.

Fred Meigel is building a brick yard at Maple Valley, Wash.

A brick and tile factory has been established at Eagle Grove, Ia.

D. J. Goode is making brick at Bertrand, Neb.

Amos Kent & Sons, of Tangipahoa, La., have put in a Chief Brick Machine.

W. R. Jordan has established a brick yard at Ellsworth, Me.

Watson & Cecil, brickmakers, of Charlotte, N. C., will also make drain tile.

Geo. W. Dearborn is organizing a company to build Brick works at Amherst, Va.

Robt. Melcher will enlarge his pottery at Weatherford Tex., and also add the manufacture of sewer pipe.

E. J. Marcom will put in machinery to double the present capacity of his brick yard at London, near Duluth, Minn.

R. L. Davis has started a large brick yard near Chattanooga, Tenn. Employs 60 men.

Knabb Bros. & Co. are constructing a large brick making plant near Atlanta, Ga.

The DeLeon Springs (Fla.) Co. have increased their capital to $60,000, with a view of enlarging their brick plant.

Walsh Bros., of Catskill, N. Y., are building a brick yard near Stockport Station.

The Collins Brick Co., of Atlanta, Ga., is constructing a yard with daily capacity of 160,000 brick.

The Florence (Kan.) Brick & Paint Mfg. Co. has been organized with capital stock, $10,000.

T. N. Connor and D. C. Gibson are going into the brick business at Monroe, La.

The Perth Amboy Terra Cotta Co. have increased their capital from $250,000 to $300.000.

Chaska Minn has ten brick yards now making half a million brick a day which are largely shipped to St. Paul.

The Cherokee Brick Co., of Sioux City, Ia., will have to put in a larger stationary engine.

The Henry Martin Brick Machine Mfg. Co., of Lancaster, Pa., report a satisfactory trade.

W. C. Henry has started a brick yard at Tracy City, Tenn., having a capacity of a million brick a year.

The Chattahoochee Brick Co. recently built a narrow gauge railroad from their works to their clay banks, eight miles or more down the river.

The Southwestern Brick & Terra Cotta Co.'s works, at Coffeyville, Kan., were burned recently, the fire starting from the roof over a burning kiln.

The Wisconsin Red Pressed Brick Co., of Minneapolis, recently secured a contract to furnish that city with four million sewer brick at $8.95 to $9.50.

The Seattle Fire Brick & Sewer Pipe Co. has been incorporated by Jno. Campbell, R. C. Washburn and R. H. Boyle. Capital stock $50,000.

The Beatrice (Neb.) Brick and Sewer Pipe Co. has been incorporated by A. C. Slith, D. W. Cook, and others, with capital stock, $250,000.

Overton & Kresterson are starting brick works near Middlesborough, Ky., and E. & F. Watts, of same place are also going into the brick business.

The Meridian (Miss.) Pottery & Mfg. Co. are thinking of adding machinery to their plant for the manufacture of fire brick and tile.

The boiler at Bradford's brick yard, near Charleston, W. Va., exploded recently. Several of the employes were seriously injured.

Jas. Jordan, of Duluth, Minn., recently sold his brick yard there and now intends to start another yard in that vicinity.

The Brown Brick Co., of Rockford, Ill., has been incorporated with $10,000 capital by R. E. Brown, Thomas Emmett, and others.

Mr. Henry Bucknam, of Columbia Falls, Me., together with Boston parties, will build a brick and terra cotta lumber factory near the former place.

A. M. & W. H. Wiles, of Grassy Point, New York, are making a new Brick Mould that they think is a great improvement over the old moulds in use, and is much more durable.

Gunniss & Seager, of Hancock, Mich., have taken Greely's advice and gone West to Duluth, Minn., where they have started a brick yard. They have contracts ahead for 3,000,000 brick.

The Jeffrey Mfg. Co., of Columbus, O., report a steady demand for their Elevating and Conveying Machinery. They are running their works full time, and the prospects are good.

McCoy, Ives & Co., Quincy, Ill., report a satisfactory trade in brick machinery. They are now running a brick yard there using the Whittaker Dry Press and have a fine plant. Those who are interested in brickmaking are invited to visit and inspect their works.

Robt. B. Smith, of Chicago is having a good trade in dry press brick machinery. The demand for the Boyd Improved Clay Pulverizer and Stone Separator which Mr. Smith controls is growing rapidly as the merits of the machine become better known.

The Lion Press Brick Co., of St. Louis, Mo., has been organized and are now making 25,000 pressed brick a day with the Lion Dry Press Machine. Opened their first kiln June 1st and found the burn an excellent one. They have begun the construction of another kiln, and will otherwise enlarge their plant.

The Brown & Harrop Mfg. Co., Portland, Ind., write that trade is good with them. Their "Leader" Brick and Tile Machine is constantly gaining in popular favor. They have a new Board Delivery Brick Table that they believe is sure to become a *leader* with the trade.

A. G. Osman's brick and tile works at Hammond, Ill., were burned recently. Loss, $4,000. Insurance, $1,000. Mr. Osman is now looking for a desirable location for a brick and tile factory and will probably select some point in Indiana or Ohio where natural gas may be obtained for fuel.

Jones & Clemans, of Anderson, Ind., report a fair trade. They are using a Chief Brick Machine and dry artificially, having put up a Chicago Iron Clad Dryer with which they are much pleased. They are using natural gas exclusively and contemplate purchasing a repress machine to enable them to make ornamental brick.

David B. Parsons writes from Waterville, a place of 1,300 inhabitants, situated in the most fertile and prosperous section of southern Minnesota, the Canon River valley, that there is a good opening there for a brick and tile factory. There is an abundance of good clay and fuel is plenty and cheap. Mr. Parsons offers to reply to any inquiries addressed to him on the subject.

C. & A. Potts & Co., report trade this spring as good. The demand for their Disintegrators and Sanders being tremendous, compelling them to largely increase their force of men to begin to keep up with their orders. They contemplate enlarging their shop by erecting a new brick building 40x120 feet, thereby doubling their capacity, and enabling them to fill all orders promptly.

Fletcher & Thomas, Indianapolis, Ind., report a continued increase in the sale of their Improved Quaker Brick Machines and Brickmakers' Supplies generally The shop has been crowded to the utmost to keep up with their orders. Within the past few weeks they have erected and started heavy steam outfits complete, including their Pug Mills and Mold Sanders at Memphis, Tenn., Little Rock, and Hot Springs, Ark.

In consequence of the growth of their business the National Barrow and Truck Co., of New York City, have been obliged to obtain new and more commodious quarters for their manufacturing department and have purchased the building on the corner of Pearl and Water Streets, in the City of Brooklyn, which they have fitted up so as to largely increase their capacity for manufacturing Barrows and Trucks. Their main office will continue at Nos. 82 and 84 Fulton St., New York, and all correspondence should be addressed to the company at that place.

Geo. W. Sharer, the well known inventor of Sharer's Patent Brick Dryers and Kilns, has found it necessary in order to give the attention his increasing Eastern business demands to leave his old home at Terre Haute, Ind., and take up permanent residence at Philadelphia. By this change the Hoosiers lose and the city of Brotherly Love gains a valuable citizen. Mr. Sharer is located at No. 134 South Ninth Street, Philadelphia, where he desires all future communications to be addressed and where he will be pleased to have his friends call at any time when in that city.

Rumor has it that a wealthy syndicate is about to assume control of all the large brick yards in Detroit, Mich., and vicinity. If the deal is successful the *brick trust* will control that market. The brickmakers of Detroit have been operating together for several years under the name of The Detroit Brick Co. All the brick made there were supposed to be sold by the Secretary, who was paid a salary of $3,000 a year and allowed 10c. a thousand for all brick sold, for office expenses. It has recently leaked out that some of the smaller brickmakers were selling clandestinely instead of through the Secretary which has led to the dissolution of the organization.

A new Power Repress for brick yards, with automatic feed and delivery, has recently been tried at Dayton, O., by the inventor, Mr. C. W. Raymond, with gratifying results. The machine is in all respects similar to their No. 4 Perfection—large and heavy and able to resist the immense pressure and wear to which it is subjected. The trial demonstrated the fact that upwards of ten thousand perfect pressed brick per day could be made upon it, and in fact the capacity is limited only by the ability of the operator to feed it. The manner of handling and working the brick is very ingenious and simple, provision is made for protecting the pressed brick during its entire movement in the machine. The advent of this machine marks a great advance in its special line.

A. Potts & Co., manufacturers of the Potts' Horizontal Stock Brick Machine, (see ad. page 430) note the following sales from the 1st of May: Lake Shore Brick Co., Erie, Pa.—Horizontal Brick Machine and Sander; J. C. Keener & Sons, Middletown, Pa.—Horizontal Brick Machine, Disintegrator, Elevator and Sander; Kemp & Thompson, Akron, O. —Brick Machine and Sander (fire-brick); J. S. Valentine, Nashville, Tenn.—Brick Machine; J. M. Rumbaugh, Calumet, Pa. —Combined Pug Mill and Disintegrator, Elevator, Sander and 40 h. p. Engine; Washington Terra Cotta Co., Tacoma, W. T.—Combined Pug Mill and Disintegrator; Steelton Transfer Co., Steelton, Pa.—Disintegrator.

THE IMPROVED CHAMPION BRICK MOLD SANDING MACHINE.

The attention of brickmakers is called to the new advertisement on the back page of the Clay-Worker of A. H. Newton & Bros., relating to their Improved Champion Brick Mold Sanding Machine. The manufacturers of this machine claim many material advantages, some of which are specified in the "ad." They were the first to place upon the market any practical mold sanding machine, and have supplied all demands from all sections of the country, and while their machines have met with the approval of brickmakers and with largely increased sales each successive season, and have been free from any serious fault of construction or operation, the manufacturers have kept an eye on the requirements of the trade and have met the same by constantly adding new features and improvements until they have produced a machine which is perfect in its operation. By an ingenious improvement of the feed they have avoided all possibility of the molds binding upon each other and at the same time have prevented the scraping and collecting of clay from one mold and depositing it on the adjacent mold, which has been the cause of "lumping" the molds. Practical brickmakers will appreciate this improvement and the fact that it tends in such a material degree to producing a clean, uniform and smooth brick. The manufacturers also come out with a fair, manly notice to the public at large that their machines are covered by several patents having broad claims. These cover not only the feed-table as originally constructed, but broadly, the rotating cylinder and a belt for keeping the molds in place while being sanded. Being the pioneers, and [redacted] ly patented should take the caution to indemnify themselves against prosecutions for infringement, as the user is just as liable as the manufacturer. In fact, in this day of patents and patented machines, it is quite customary for manufacturers to indemnify purchasers and users of their machines against damages accruing by reason of infringement.

Mention the Clay-Worker

When writing to Advertisers
Mention the Clay-Worker.

The Link Belt Machinery Co.,

New York, Minneapolis. CHICAGO, ILL., 11 to 23 South Jefferson St. BURR & DODGE, Philadelphia.

MAKE

ENDLESS TROUGH CONVEYORS,

Adapted to handling (on incline) clay direct from clay-bank, or pit.

METALLIC APRON CONVEYORS,

(Sometimes called clay elevators). Adapted to feed Brick or Tile Machine.

TILE ELEVATORS, (New Pattern),

Will elevate any size up to 18-inch. Send for Prices.

LINK BELT ELEVATORS (using buckets),

Will elevate Semi-Dry or Pulverized clay.

We are prepared to contract for the entire machinery required for a Complete Brick or Tile Works of any capacity.

Send for 1888 Catalogue.

(Mention the Clay-Worker.)

FOR SALE, WANTED, ETC.

☞Advertising rates in this column 20 cents a line, or 3 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion.☜

CLAY GIVEN AWAY. Immense beds suitable for paving brick, pressed brick and fire brick. Address JAY BAKER & Co.,
Streator, Ills.
3 4 c.

FOR SALE. Stedman Pulverizer; new improved. 40-inch, with fly-wheel; in perfect order.
CARTERET BRICK WORKS,
Carteret, N. J.
5 3 c.

FOR SALE. One Frey, Sheckler & Hoover four roll clay crusher, a good and strong machine. Will sell cheap. Address ANTHONY FRIES,
Brookville, Ind.
4 3 d.

c

FOR SALE. Clay land on track; unlimited cash demand for brick in Duluth, St. Paul and Minneapolis. Address F. McNAMARA,
Little Falls, Minn.
6 6 c.

[redacted]

WANTED a second-hand Centennial Automatic Brick Cutting Table—side cut. Must be in good condition. Address "C. S." care Clay-Worker.
6 1 c.

WANTED Fire Brick Salesman, acquainted with Chicago and Northwestern trade. Address, stating terms, etc. Box 38, care Clay-Worker.
6. 1 d.

FOR SALE AT A BARGAIN. One 25-horse-power Portable Boiler on skids, complete; all in good condition. Price and particulars given on application.
FLETCHER & THOMAS,
Indianapolis, Ind.
6 tf. d.

FOR SALE. A first-class Steam Brick Yard, in operation; 54 acres of good clay. Good demand for brick within one mile of centre of city of fourteen thousand inhabitants. Reason for selling—other business. Address, Box D, Care of Clay-Worker.
6. 1. 1p.

WANTED. A position as foreman in sewer pipe or architectural terra cotta works, by a practical and reliable man, industrious and sober and fully competent to manage either of the above works.
Address SALI-SILICATE,
Care of Clay-Worker.
4 tf.

FOR SALE. One Whittaker Semi-dry Brick Machine; one Stedman Pulverizer; one Bucket Elevator; all in good order, having made only about 600,000 brick. J. M. HARRY & Co.,
Dallas, Texas.
2 6 5p.

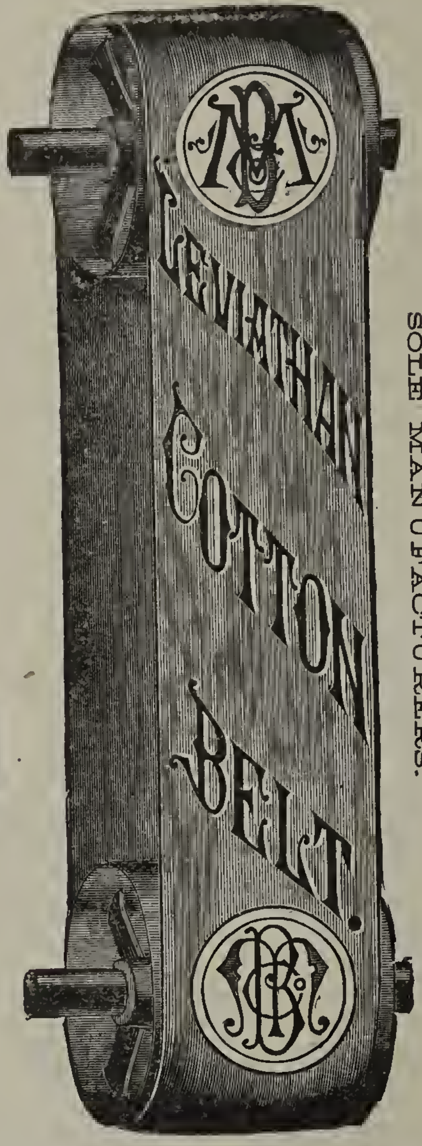
FOR SALE. One Grand Automatic Pug Mill complete with two 36-in. pulleys, used only four months, almost new. For sale cheap. Address at once WESSELS & NIEMANN,
Jefferson Ave. and Cherokee Sts, St. Louis, Mo.
4 4 c.

FOR SALE. One Kennedy Dry Clay Brick Machine in good order, cheap. One Martin Brick Machine, Pug Mill, Engine, Boiler and everything complete for running. Address
D. P. SHENFELDER & Co.,
Reading, Pa.
5 2 c.

FOR SALE. Way down in price. Big bargain. Large Stationary Engine—cylinder 42x18 inches, band wheel 28 in. face and 12 ft. diameter, fly wheel 16 ft. In good order. Have no further use for it and must be moved. Will sell cheap if sold before removal.
Address, P. HAYDEN SADDLERY HDWE. Co.,
Columbus, Ohio.
6. 1. d.

FOR SALE. Having changed h. p. to steampower, I offer for sale very cheap a h. p. Quaker Brick Machine and one good brick press, and one good Tiffany-Centennial Brick and Tile Machine with 3, 4, 5, 6 and 8 inch dies. This machine was only in use several months. A. STOLZ,
Meadville, Pa.
4 3 d.

WANTED. An experienced and reliable man with some capital to take an interest in and the management of a drain tile and ornamental brick factory. A large and rapidly increasing demand for this ware and an abundance of excellent clay. To the right party very favorable terms will be made. For particulars, address GARIG, REDDY & HART,
Baton Rouge, La.
5 1 d.



SOLE MANUFACTURERS.

Main Belting Co.,

Manufacturers of the Celebrated

Leviathan Belting!

WHICH FOR

Strength and Traction Power

HAS NO EQUAL.

Specially adapted for Brick and Tile Machinery.

Unaffected by Heat, Steam or Dampness.

Send for Price List.
Samples sent on application.
Mention this paper.

FACTORY AT PHILADELPHIA.

Address,

Main Belting Co.,
248 Randolph Street, CHICAGO, ILLS.

NOTE—To any responsible party sending us measures, we will ship a "Leviathan" Belt on sixty days trial; to be paid for if satisfactory.

SEE THE BATTLE OF ATLANTA.

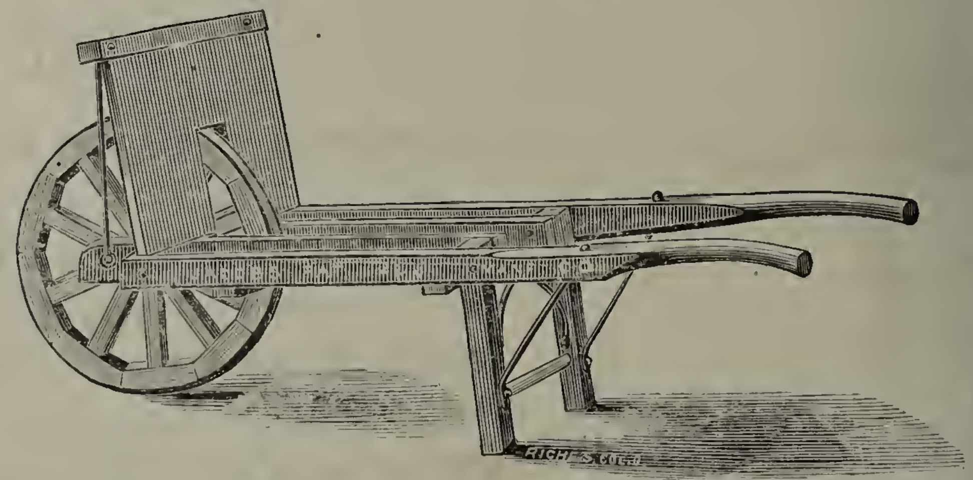
Market St. Between Ills. St. and State House, Indianapolis.

The Kilbourne & Jacobs Manufacturing Co.,

LARGEST MANUFACTURERS IN THE U. S., OF

Bolted Brick Barrows, Mule Trucks, Spring Brick Trucks, Road Scrapers, Wheel Scrapers, Grading Plows,

AND BARROWS OF ALL KINDS.



Open Bottom Brick Barrow, with Jacob's Patent Wood Wheel.

Handles 52 inches long; Legs 17 inches high; Bottom 23½ inches wide, 29 inches long; Dash, 24 inches wide, 19½ inches high.

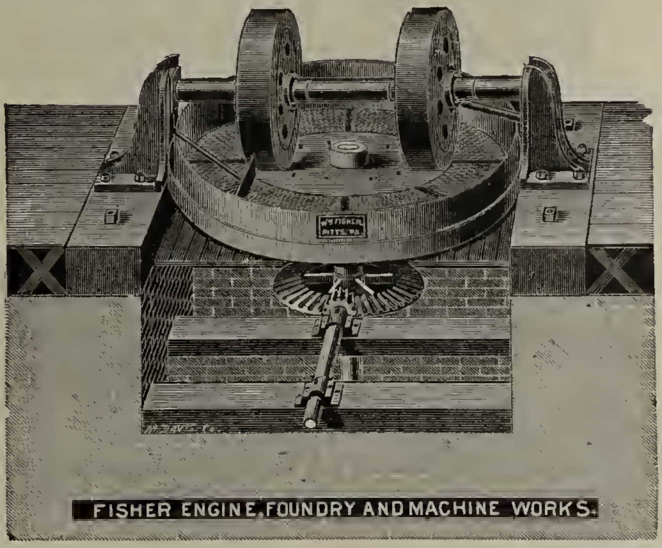
This Barrow is designed for use in Brick and Tile Yards, and especially for handling green brick. Diameter of Wheel 19 inches; width of Tire, 1¾ inches.

These Barrows fold for shipping same as our Garden Barrows. ☞Send for General Catalogue.

THE KILBOURNE & JACOBS MFG. CO. - - Columbus, Ohio.

STANDARD EIGHT-FOOT DRY GRINDING PAN.

For Fire Clay, Red Brick Clay, Limestone and Lime, Sand and Other Refractory Materials.


W. FISHER PITTS. PA
FISHER ENGINE, FOUNDRY AND MACHINE WORKS.

DESCRIPTION.

This Pan is undergeared and will grind Fire or Red Clay for 20,000 brick in 10 hours.

The Rolls weigh 5,000 lbs. each.

We make this Pan in different sizes, from 5 feet to 9 feet in diameter.

We also make them with iron frames or wood frames for overhead gear.

WE ALSO MANUFACTURE

Wet Grinding Pans from 5 to 12 ft. in diameter.
Stationary or Revolving Pans.
Glass House Pans.
Pug Mills with Iron Boxes.
Brick Presses. Press Boxes.
Brick Molds. Tile Presses. Engines. Gearing.
Blake Crushers, and Special Machinery.

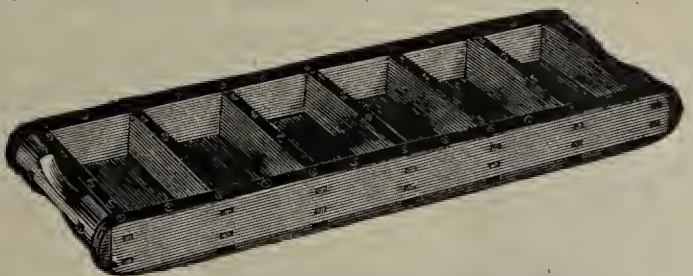
WM. FISHER, Proprietor,

23d, 24th and Smallman Sts., PITTSBURGH, PENN.

G. COLDEWE & CO.,

—MANUFACTURERS OF ALL KINDS AND SHAPES OF—

HAND AND MACHINE MOULDS.



We manufacture the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

☞Sample Moulds sent to any place in the United States free of charge. Send for Circular.

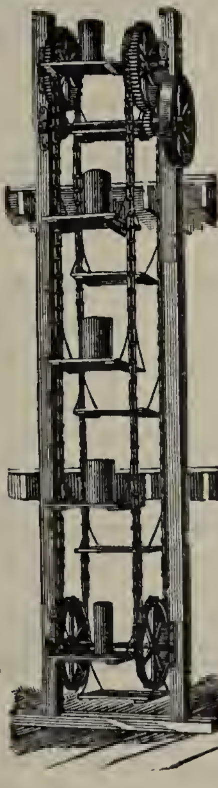
No. 829 Sixth Street, Milwaukee, Wis.

☞Mention the CLAY-WORKER.

ELEVATORS FOR CLAY, COAL, ORES, SAND, GRAIN, ETC.

SECTION OF CONVEYOR.

ELEVATORS FOR TILE, BRICK, PACKAGES, &C.



Roller & Detachable

CHAIN BELTING,

Designed for

Elevators, Conveyors, Drive Belts,

—For Handling—

BRICK, CLAY, TILE, COAL, ORES, ETC.

Estimates for handling material of any kind cheerfully furnished. For '88 Catalogue and prices

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The Jeffrey Manufacturing Co.,
112 East First Avenue,
COLUMBUS, - - OHIO.

FOR SALE OR RENT. Brickyard near Richmond, Va. 21 acres, railroad switch to the kilns, abundance of best clay, new buildings, sheds, clamps, wheels, moulds, barrows, mules, carts, etc. For information, apply to JOHN C. GIBSON, Richmond, Va.
4 6 c. or J. J. Gordon, P. O. Box 228, Cincinnati, O.

FOR SALE. Two Pug Mills, one Chambers Compound Rolls, new, cost $1,200, will sell for $500; 9,000 Chambers Pallets, cost 70 cents, will sell for 25 cents, as good as new; 17 Drying Tunnels; 3 Transfer and 3 Dump Cars; large amonnt of belting, shafting and pulleys; all the above as good as new. Apply to C. E. EHLERT.
2. tf. c. Room 1, 167 Dearborn St., Chicago, Ills.

FOR SALE. A complete outfit for a Steam Brick Yard of 20 to 25,000 daily capacity, consisting of one Quaker Brick Machine, one Fletcher & Thomas Pug Mill, Champion Mould Sander, one 40 h. p. Atlas Steam Engine with 8 ft. driving pulley, Governor, Shafting, Pulleys, Belting, etc., one 44in.x12ft. tubular Boiler, Inspirator, Pallets, Trams, etc., etc. All in good order and will be loaded on cars at a bargain.
Address, P. W. SHERWOOD,
6 2 c. Bessemer, Ala.

FOR SALE. The most beautiful piece of property in the vicinity of Washington, D. C. A tract of 188 acres, embracing many beautiful sites for county seat, with the whole of the National Capitol in full and new view. This tract contains seventy-five or more acres of the purest clay—of an average depth of twenty feet, within two and a half miles of Washington, and is the most available location in its vicinity for an extensive brick manufacturing plant, being near the Long Bridge across the Potomac and on the line of the Pennsylvania R. R. A rare opportunity. Correspondence invited. Address W. D. ADDISON,
6. 1. d. No. 1 W. Balimore St., Baltimore, Md.

WANTED. Practical and competent man with some capital to lease or operate on shares, brick plant situated between Duluth and St. Paul and Minneapolis. Market for all brick that can be made at profit of from $2 to $5 per M. Present owners not practical brickmakers and desire some man with money who is to take control. Liberal terms will be made. Permanent kiln capacity 1,500,000. Inexhaustible bed of fine red clay. Wood $1.00 per cord; coal $3.50 per ton. Kilns all fitted for oil burning. Machinery all in fine order. Railway into yard. Everything complete. Thorough investigation invited. We have 1 Simpson Press, capacity 20 to 24,000 per day; 1 Andrus Press, capacity 15 to 20,000 per day; 2 Steadman Pulverizers, capacity each 30,000 per day; 70 horse-power Engine, Boiler, Elevators, Screens, Trucks, Scrapers, Oil Burners, Tanks, and complete outfit for sale cheap. Liberal terms. Write for description. All machinery in fine repair and warranted to do good work. For further particulars addrress C. P. HAZELTINE,
6 2 d. 222 Nicollet Ave.,
or E. A. Gooding, 635 Temple Court, Minneapolis, M.

COLORIFIC.

For coloring Brick, Mortar and all Clay Products a deep and permanent red. Most, if not all, colors in the market are artificially prepared. Colorific is a natural color. References and directions furnished for use. Sample free. Ask for price of WESTBROOK & WELLS,
4 6 d. Ogdensburg, N. Y.

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SEWER PIPE & FIRE BRICK CO.,

Grand Junction, Tenn.,

Manufacturers of

SEWER PIPE, FIRE BRICK,
PAVING AND COMMON BRICK,
FIRE BACKS OF ALL SIZES.

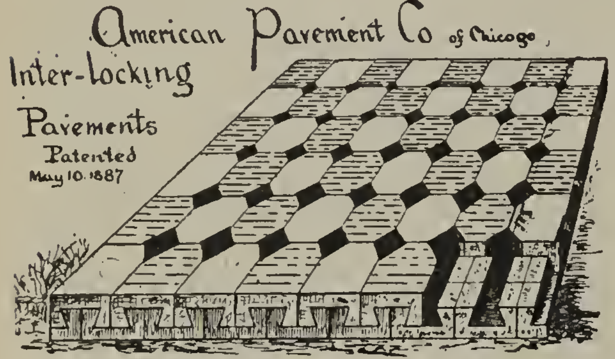
Quartz Sand for Paving; Fire Clay in Barrels, Bulk, Crushed; Potters Clay; Modeling Clay; and White or Red Moulding Sands.

We refer by permission to the Potteries that are now using our Clay:

Pauline Art Pottery, Chicago.
Virgin & Sons' Pottery, New Orleans.
J. W. Deady " "
New Orleans Art Pottery, New Orleans.
Milburn Iron Works, (Fire Clay) Memphis.
Equitable Gas Co., "
City Gas Works, "

☞Samples and prices furnished on application.

New Article of Manufacture for Clay Workers.



THE AMERICAN PAVEMENT CO., WILL SELL TERRITORY, OR LICENSE TO MANUFACTURE THE LOY PATENT PAVING TILES, AN INTERLOCKING AND SELF-BINDING STRUCTURE.

A HANDSOME ILLUSTRATED CIRCULAR FREE TO BRICK AND TILE MAKERS.

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159 La Salle St.,
CHICAGO, ILLS.

PHYSICAL AND CHEMICAL

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Assaying and analyzing in all branches. Working results given. All communications confidential. References: Christy Fire Clay Co., St. Louis; Pacific White Sand Co., St. Louis; Kansas City Sewer Pipe Co.; DePauw Plate Glass Co.; Thos. Coffin Co. and hundreds of other annual customers all over the United States. Address as above.

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DOUBLE STRENGTH
CULVERT
PIPE
WITH
IMPROVED SOCKETS
AND IN 2½ FOOT LENGTHS
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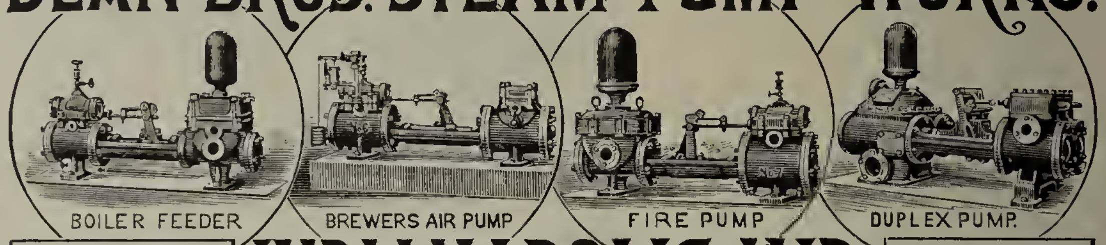

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SERVICEABLE.

STEAM ENGINES

IN STOCK FOR
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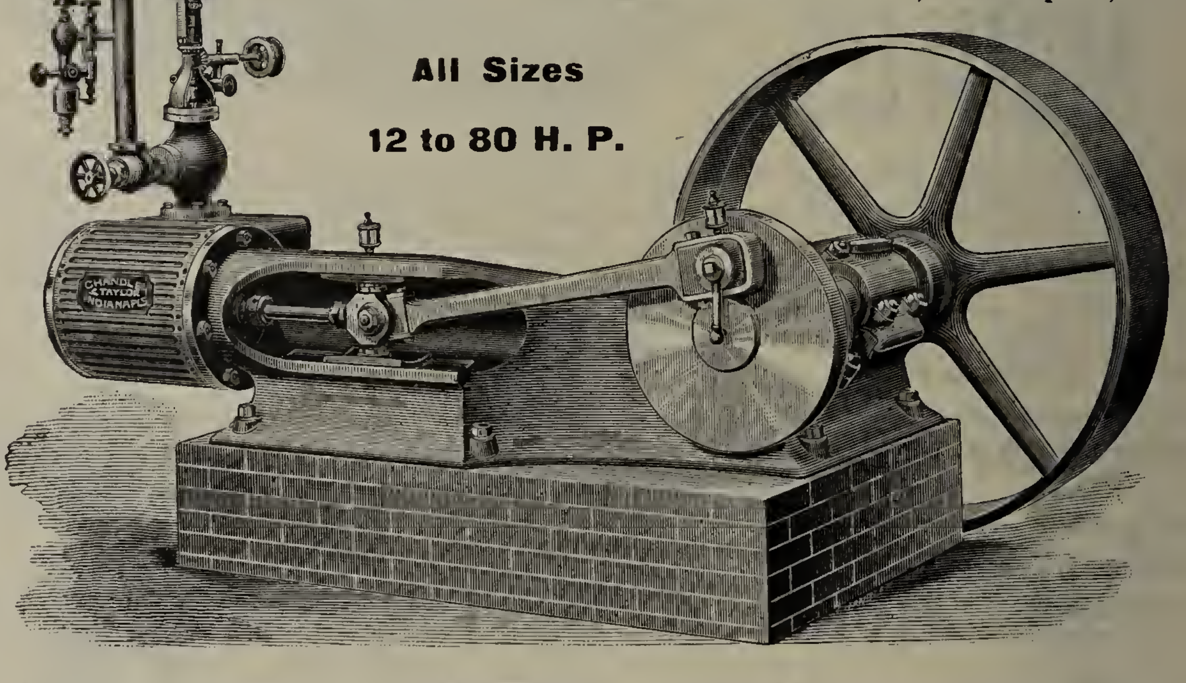
Every Engine Tested Under Full Load Before Shipment.

Address **CHANDLER & TAYLOR CO., Indianapolis, Ind.**



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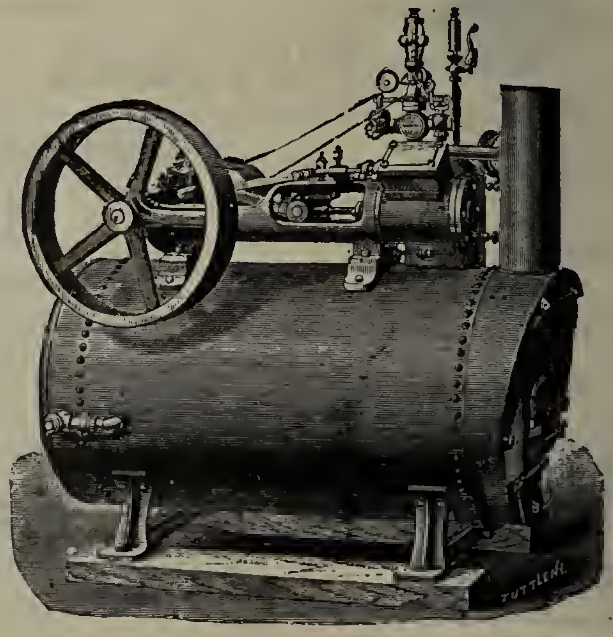
STEAM ✦ ENGINES!

Upright and Horizontal,

Stationary, Portable, and Semi-Portable.

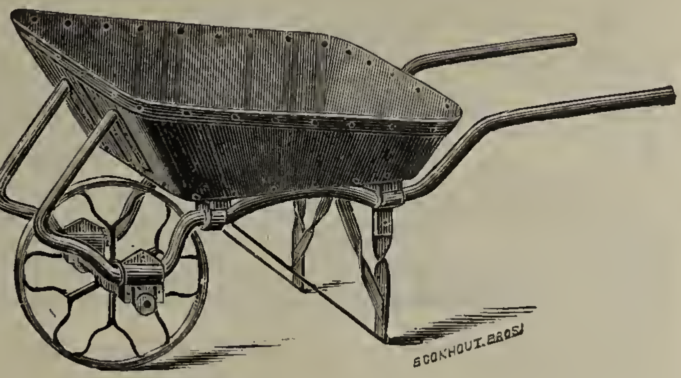
All sizes, from Three to Twenty-six Horse-Power. Compact, Substantial, Economical and Easily managed. Guaranteed to Work Well and give the Full Power Claimed. Over 4,000 in Successful Operation. Not One Ever Exploded. No Engine Built so Well and so Low in Price. Illustrated Pamphlet Free. Address,

JAMES LEFFEL & CO.,
Springfield, Ohio,
Or No. 110 Liberty St., New York City.



The National Barrow and Truck Co.,

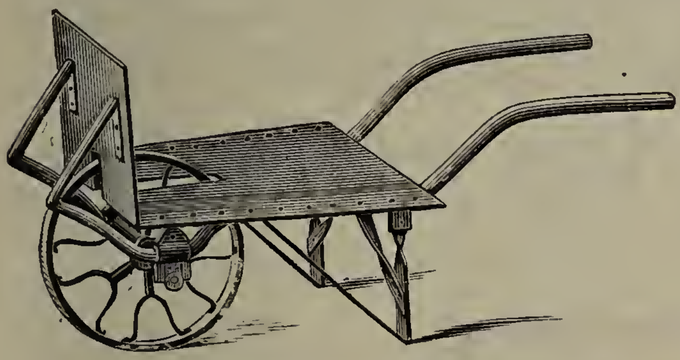
82 and 84 Fulton St., New York City.



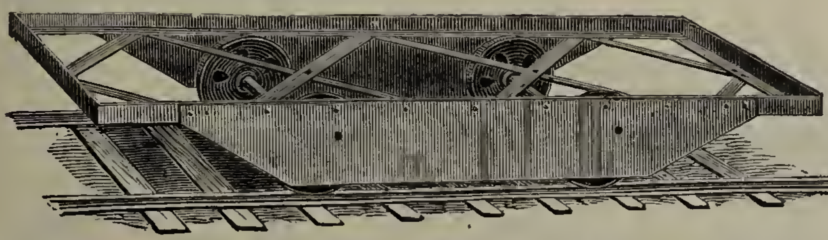
Manufacturers of Steel Wheel Barrows for handling Sand, Clay, Brick, Coal, Etc.

Also manufacturers of the Fitch Steel Pallets, Wrought Iron and Cast Iron Brick Drying Cars a specialty.

Our Barrows are used largely by the brick manufacturers in New Jersey and along the Hudson River. For our Drying Cars we refer to the Lorillard Brick Works, Keyport, N. J., and for our Pallets to Perth Amboy Terra Cotta Works, Perth Amboy, N. J. Send for illustrated catalogue and price-list.



BARROWS FOR GREEN BRICKS.



WROUGHT IRON BRICK CARS.

AVERY'S SEAMLESS STEEL BUCKETS FOR CLAY, ORE & ANY DAMP SUBSTANCE.

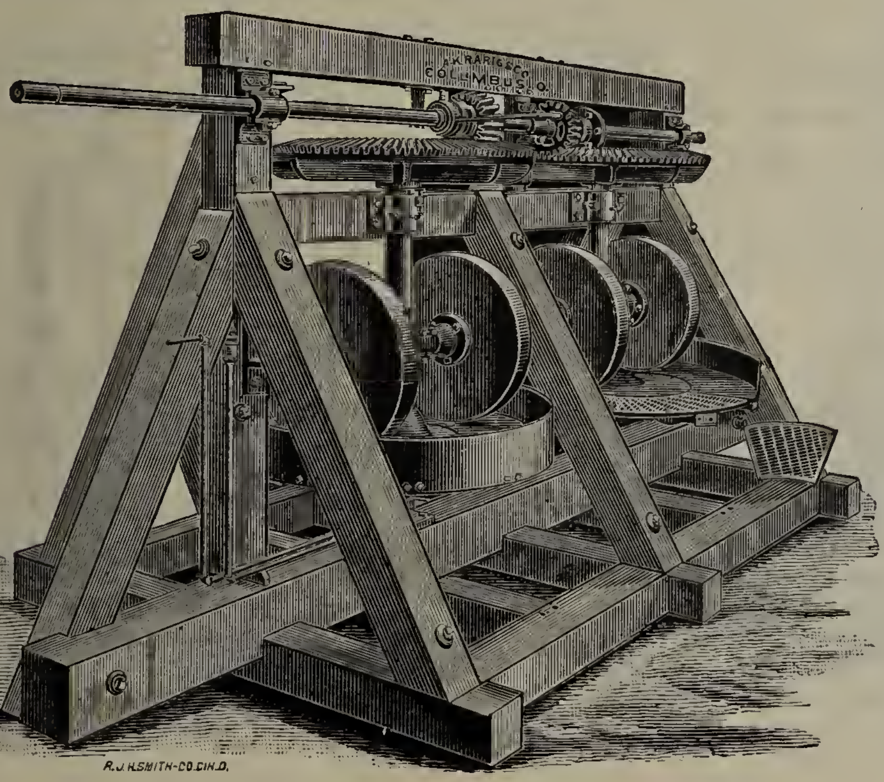
MANUFACTURED BY THE AVERY ELEVATOR BUCKET Co CLEVELAND. OHIO.

WE MAKE SEAMLESS STEEL BUCKETS FOR EVERY USE

We do STAMPING and PRESSING of sheet metals for all classes of work. Also TINNING, GALVANIZING and JAPANNING.

ALEX. K. RARIG & CO.,

Founders, Machinists and Boiler Makers, Columbus, O.


A. K. RARIG & CO. COLUMBUS, O.
R.J.H.SMITH-CO.CIN.O.

Office and Works: Cor. Water and Chestnut Streets, near new Union Depot.

Steam Sewer Pipe and Tile Presses, Grinding and Tempering Pans, Sewer Pipe, Tile and Fire Proof Dies, etc.; Automatic Cut-off and Slide Valve Engines, Boilers, Pulleys, Hangers and Shafting, Steam Pumps, Pipe Fittings and Architectural Iron Work.

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Engraver on Wood
13½ E. WASHINGTON ST.
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WOOD PHOTO ENGRAVERS
PATENT SOLICITORS. HAND BOOK FREE.
MINTURN & MINTURN
31 TO 33 SENTINEL BLDG.
INDIANAPOLIS, IND.

IMPORTED MUSIC WIRE

For Cut-off Tables,

All ∴ Sizes ∴ and ∴ Any ∴ Quantity

Write for prices.

FRED. A. RICH, 23 South Canal Street,
CHICAGO.

Tube Expanders for Boilers.

Akron Fire Brick Co.,

—MANUFACTURERS OF—

FIRE BRICK

Of all shapes and sizes for Sewer Pipe, Stoneware and Tile Kilns. Also ground Fire Clay for mortar. Having made the special shapes necessary for this work a study we have mainly intended to lessen the masons labor and at the same time produce a better construction of the work. Address

B. M. ALLISON, Sec'y,
6th Ward, AKRON, O.

OPEN FOR BUSINESS.

The Pennsylvania Railroad Rebuilt Through the Flooded District.

Under the direct supervision of the officers in charge of the Engineering and Transportation Departments of the Pennsylvania Lines the last rail needed to connect the several parts of the great thoroughfare has been placed in position. The new track is substantially built, and it will be gradually tested until Monday, June 17th, when the Great Trunk Line will be opened, and express trains with Pullman cars will again run through in both directions, between Chicago, St. Louis, Indianapolis, Cincinnati, Toledo and Cleveland on the west, and Baltimore, Washington, Philadelphia and New York on the east.

Bluff Springs Academy!

For Northern and Southern pupils. Board and Tuition in all branches, including Music, $15.00 per month.

—LOCATED AT—

BLUFF SPRINGS, Escambia Co., FLA.

(The healthiest place in the South.)

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We are the diggers and shippers of the Centerton Brick Sand, which is the best brirk sand ever discovered. It burns a *cherry red color*; it is very regular in quality. *It does not ball up, or stick in the mold.* Will furnish sample in natural state and burned to show color. Send for prices. We also supply Sand, Riddles, Spades, Shovels and other supplies for brick works.

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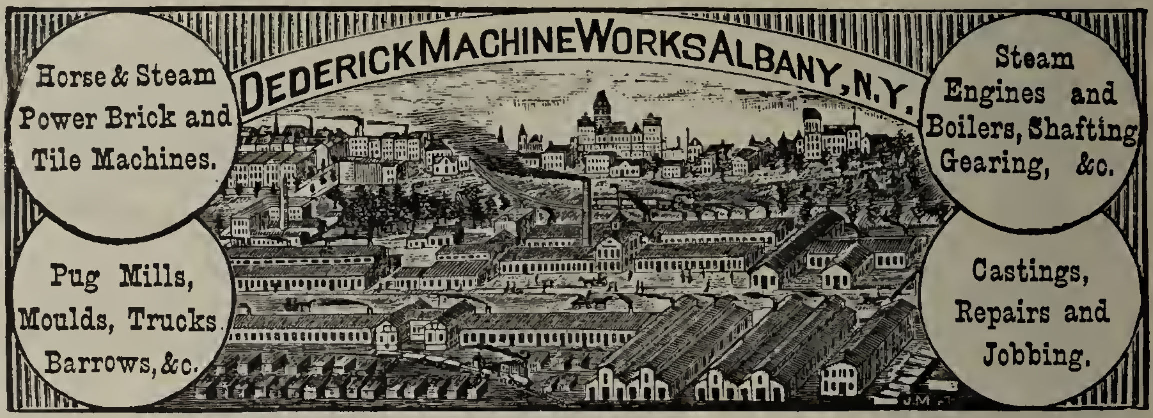
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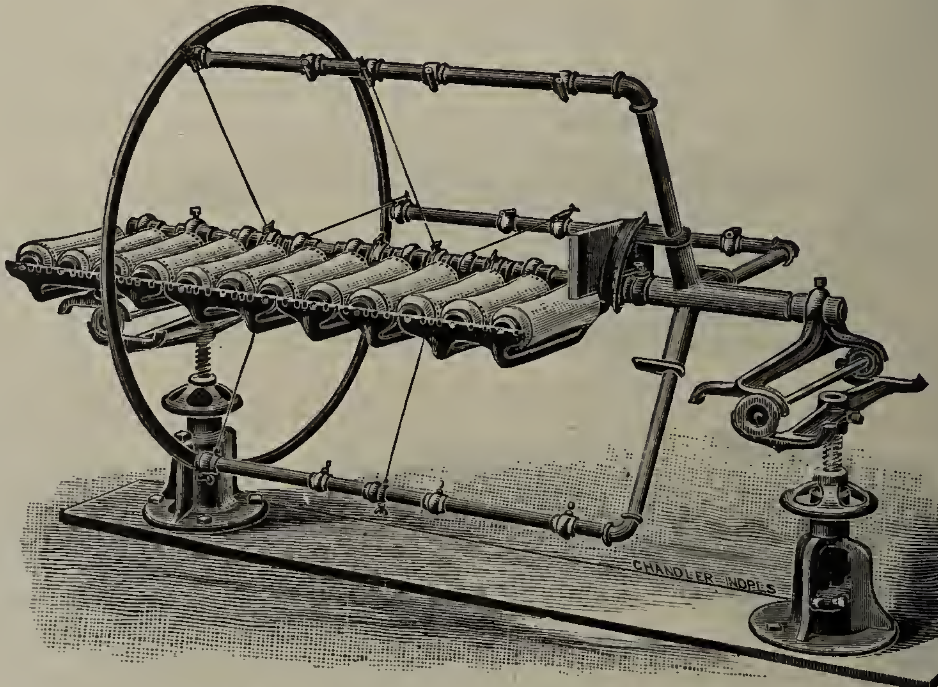

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Can be used with any Auger Machine,
SAVES TIME. SAVES LABOR. SAVES WARE.

Cutting Wires pass but once through and always downward. No upward cut, nor lifting wire back through clay to rough ends of Tile or Brick. Sold on approval. Write for prices.

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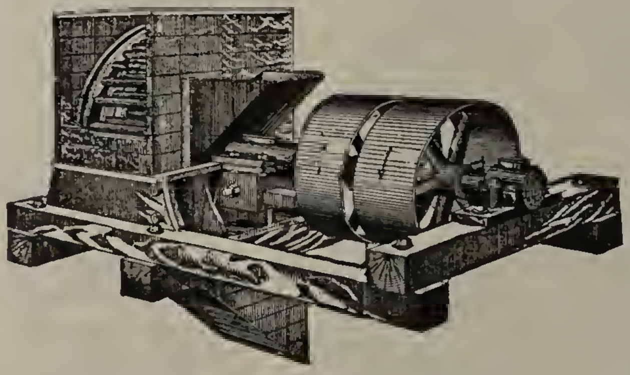

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The proprietors of this invention propose to sell kiln yard or territorial rights reasonably and guarantee it to be the best kiln the purchaser ever saw or used.

Everybody is cordially invited to visit our works, where a kiln is, almost, in constant operation. We also have an arched iron door frame which is indispensable to a perfect kiln.

Send for circulars and testimonials.

We shall protect our patents from infringements.

Reliable resident agents wanted. Address—

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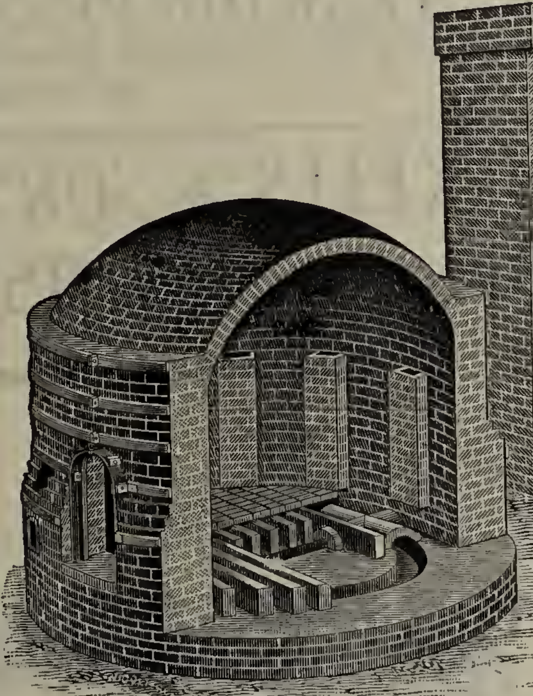

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A large capacity and easy working pump for **Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries,** or wherever it is desired to raise a *large quantity* of water by *Hand-power.* The pump has large valves (*accessible by hand*) and will pump water containing *sand, gravel, mud, sewage matter, etc.,* without *choking* or any *perceptible wear.*

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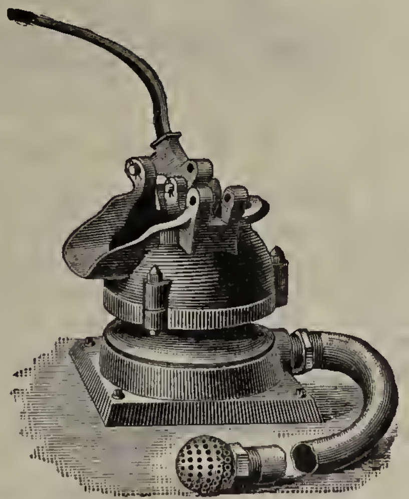

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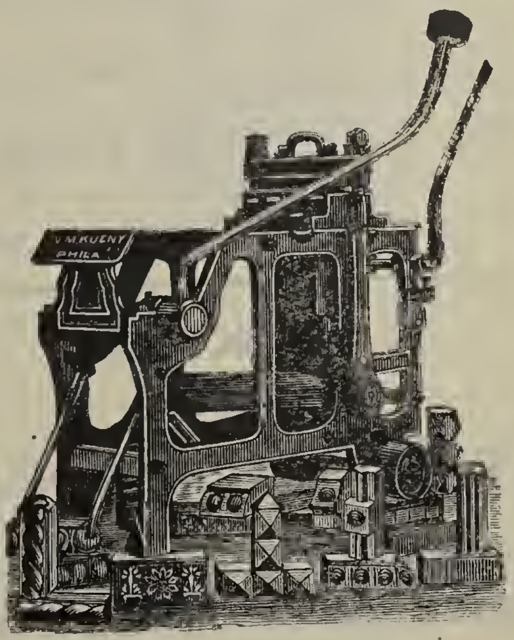

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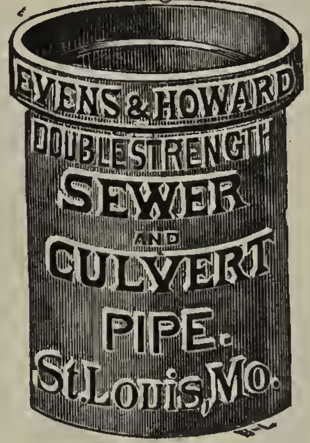

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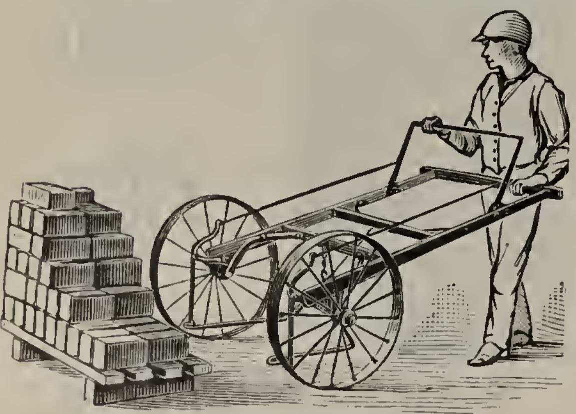
Portable Hack.



The principle of handling and drying bricks by the Portable Hack System has been perfected in this Truck and VENTILATED HACK BOARD, being the most practical Truck and method ever yet introduced, saving labor in handling and time in drying bricks. Can be used in any yard not too steep. Is especially adapted for medium dry clay machines.

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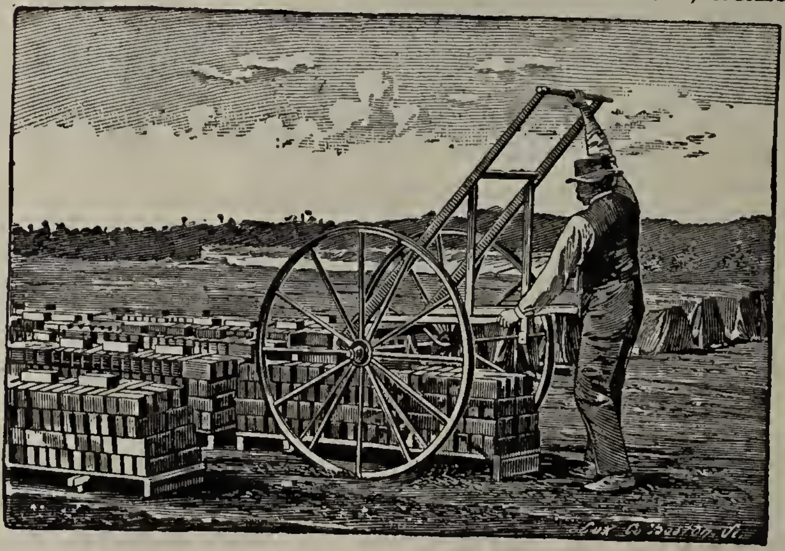
Economy Portable Brick Hake.

Patented Sept. 22, 1885, Re-issued Feb. 23, 1886. By
M. WALKER and E. MINER, Yankton, Dakota.



We desire to call the attention of all brickmakers to our PORTABLE BRICK HAKE, which certainly furnishes the cheapest and best means of handling brick from the machine to the yard, and from the yard to the kiln ever yet made use of. By this device the brick when taken from the machine are placed directly upon the haking boards, and when filled the haking boards are taken up by the truck and conveyed to the yard, where they are set down in rows end to end, where they remain until dry, when the truck comes again, picks up the hake of brick and takes it to the kiln. Thus one man does the work of four and the bricks go into the kiln in much better shape by not being handled while they are soft. We have a truck made especially for handling soft molded bricks on pallets. Yard County and State rights for sale. Please address for circulars and for further information,

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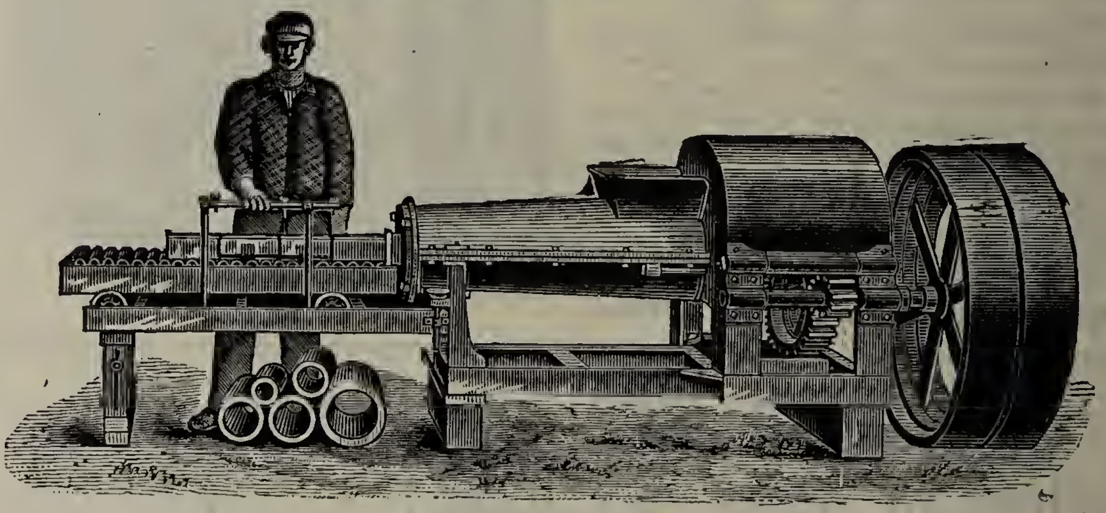

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This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of Brick and different sizes of Tile by changing dies. For strength and durability we except none. We chalenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22, 1880; and February 12, 1884. We can furnish Crushers and also Trucks.

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We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 18 inches and on our No. 2 Machine we can make tile from 2½ up to 12 inches.

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Boehncke & Rohwer's Patent Continuous Brick Kiln.

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A perfect result from any refuse fuel.

No loss in burning.

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A certain amount of burned goods turned out every day.

Reference: Omaha Brick & Terra Cotta Manufacturing Company.

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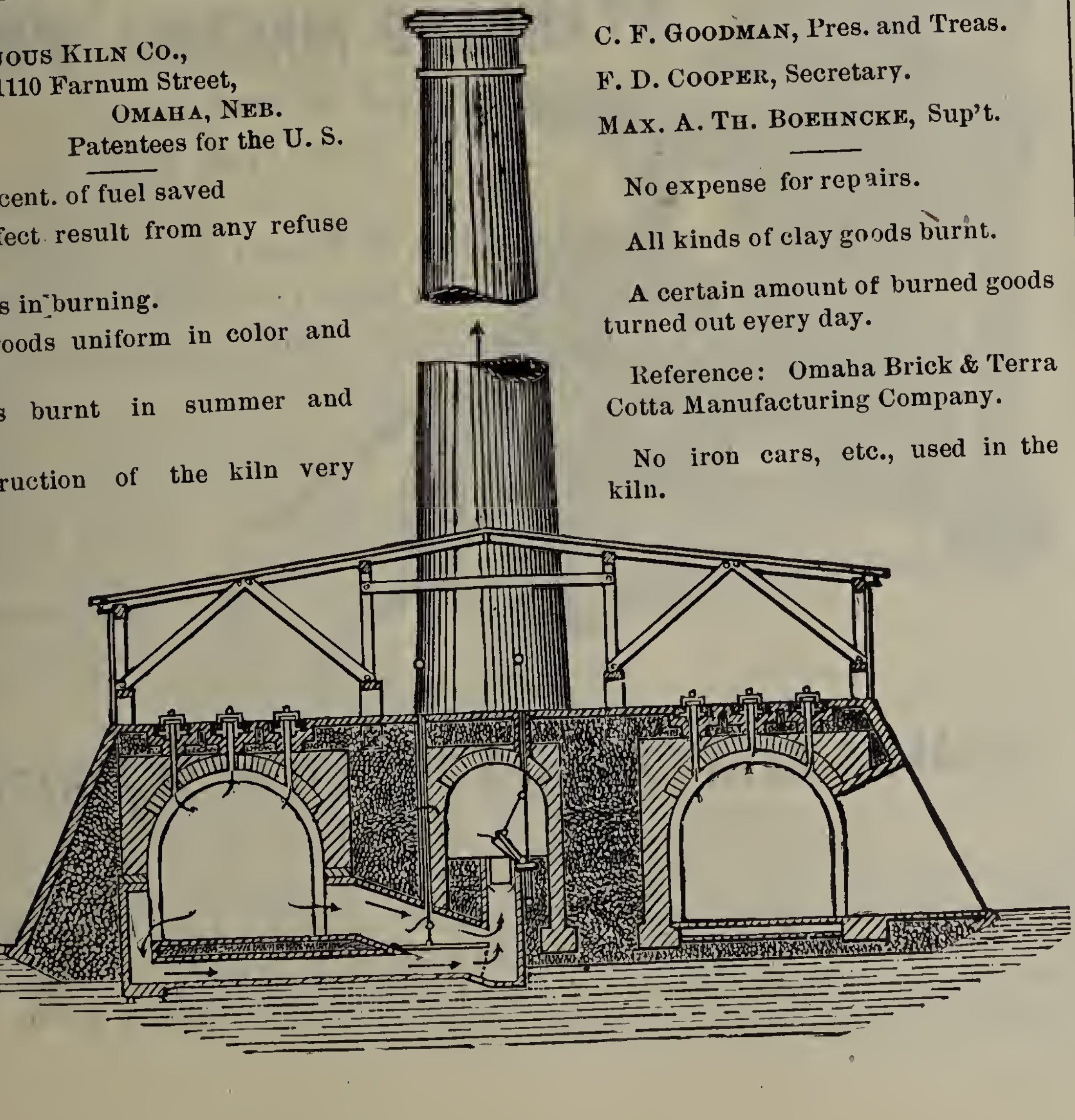

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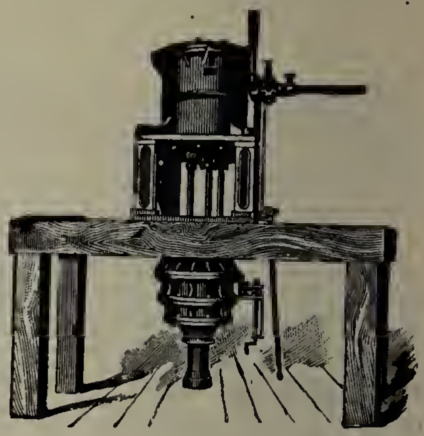
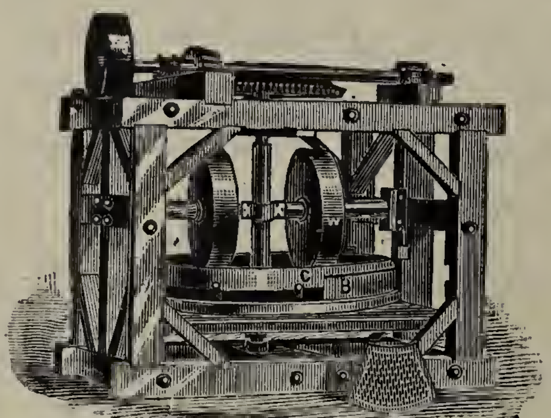


Brick & Terra Cotta Machinery.



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STANDARD MACHINE WORKS,
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Manufacturers of all kinds of
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WE GIVE THESE AS REFERENCES:

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In placing this Improved Machine before the public and setting forth what we claim for the merit of the machine, we guarantee to fully verify in the practical operation of the machine.

This process of brickmaking has been thoroughly tested and has proven to be a perfect success, and is as cheap a process as any on the market. The machine is constructed wholly of iron and weighs upwards of twenty thousand (20,000) pounds. It is simple and durable. The operation of it is easily understood. Its capacity is two thousand (2,000) brick per hour. The brick are far superior in strength and finish to common brick. The clay is worked at a consistency that under pressure deposits the greatest amount of clay in the brick, giving them great strength and thereby making them especially adapted for street paving purposes. In actual tests where there has been the strongest competition there has not been a brick submitted that would stand near the pressure, absorb as little water, or stand the wear by friction as these brick.

If Brickmakers or those that are going into the business will send us a barrel of their clay we will fully demonstrate the quality of the brick in this respect.

Not having sufficient capital we desire to dispose of an interest in the patent and business generally to some one, or company that would have sufficient capital to push the manufacture and sale of this machine as the merit of it would justify or demand.

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GRANT & MURRAY,

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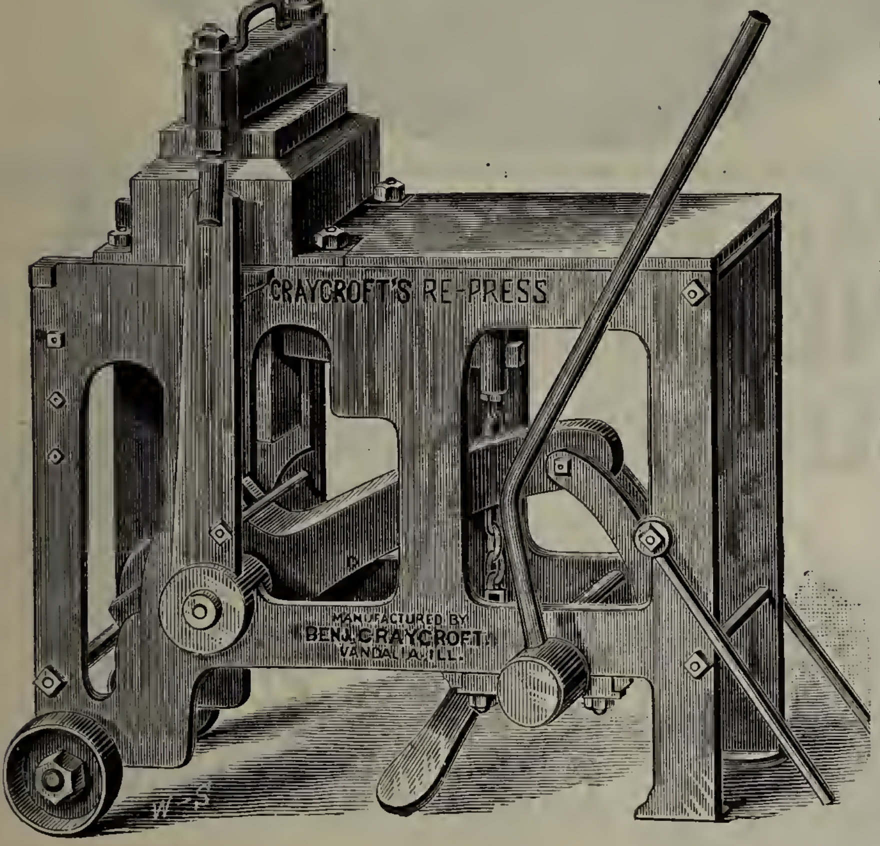
Mention the Clay-Worker].

The Craycroft Re-press Brick Press.

For Re-pressing Red and Fire Brick.



This Re-Press, Fully Guaranteed, will be shipped to Responsible Parties on Trial for a Reasonable Time.

This press has all modern improvements, and is equal to any in the market.

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Sample bricks from this machine furnished on application.

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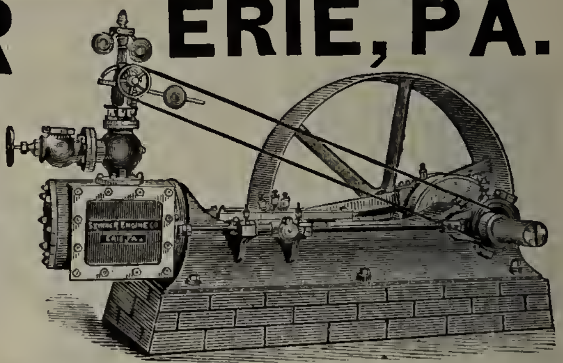
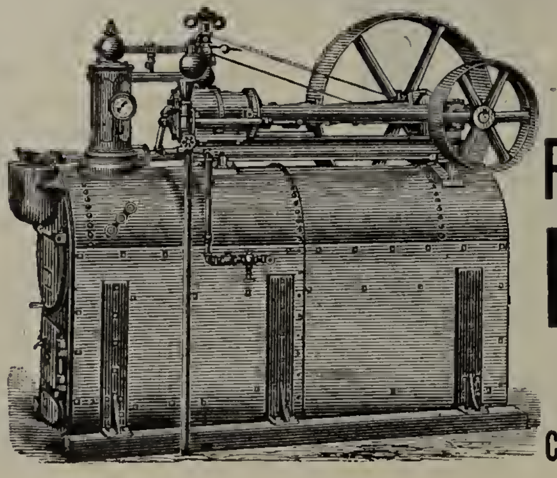
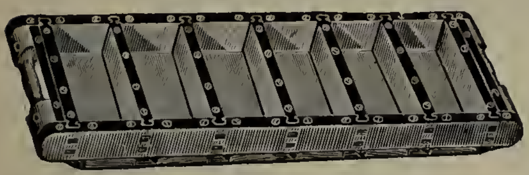
OVER 3400 IN USE



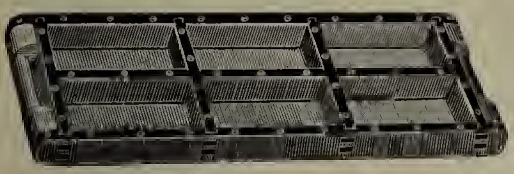


MANUFACTURERS OF
PORTABLE AND STATIONARY
Engines AND Boilers
SEND FOR CATALOGUE.
NEW YORK AND NEW ENGLAND OFFICE:
C. R. VINCENT & CO. 15 Cortlandt St. NEW YORK.

6 B. MACHINE MOULD.



6 B. HAND MOULD.



3 B. HAND MOULD.

D. J. C. ARNOLD,

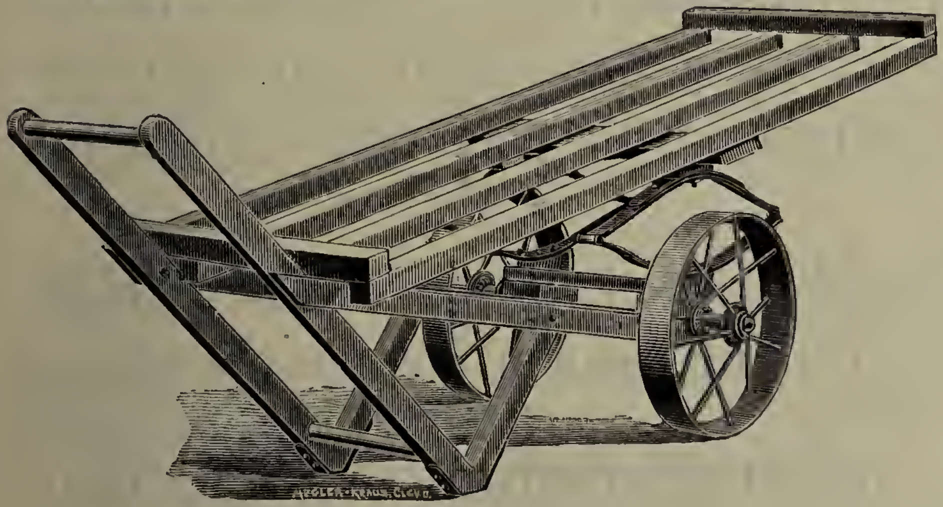
MAKES ∴ BRICK ∴ YARD ∴ SUPPLIES

At NEW LONDON, OHIO.

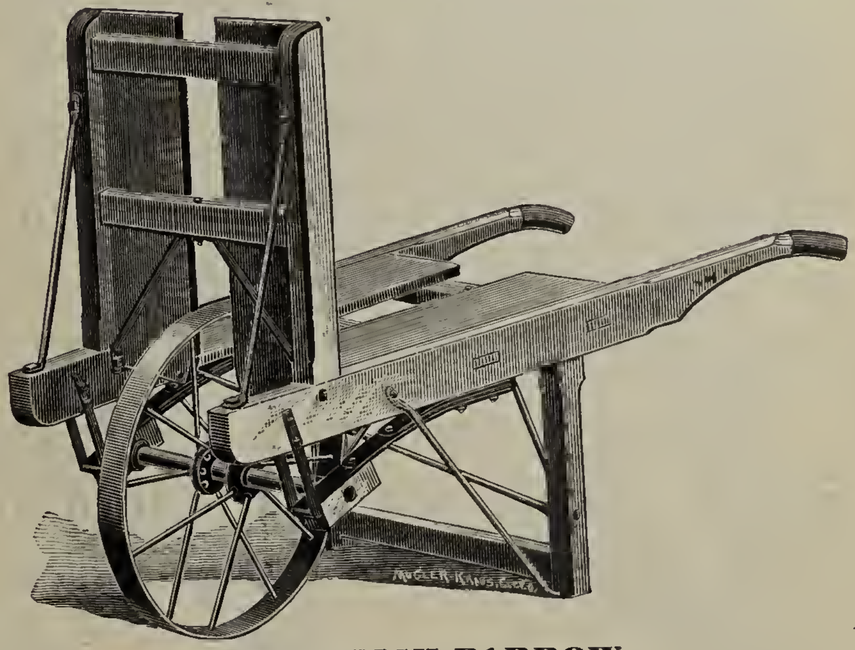
Get his prices before you buy. All goods first-class in every respect.

[Mention the Clay-Worker.]

☞Catalogue sent on application.



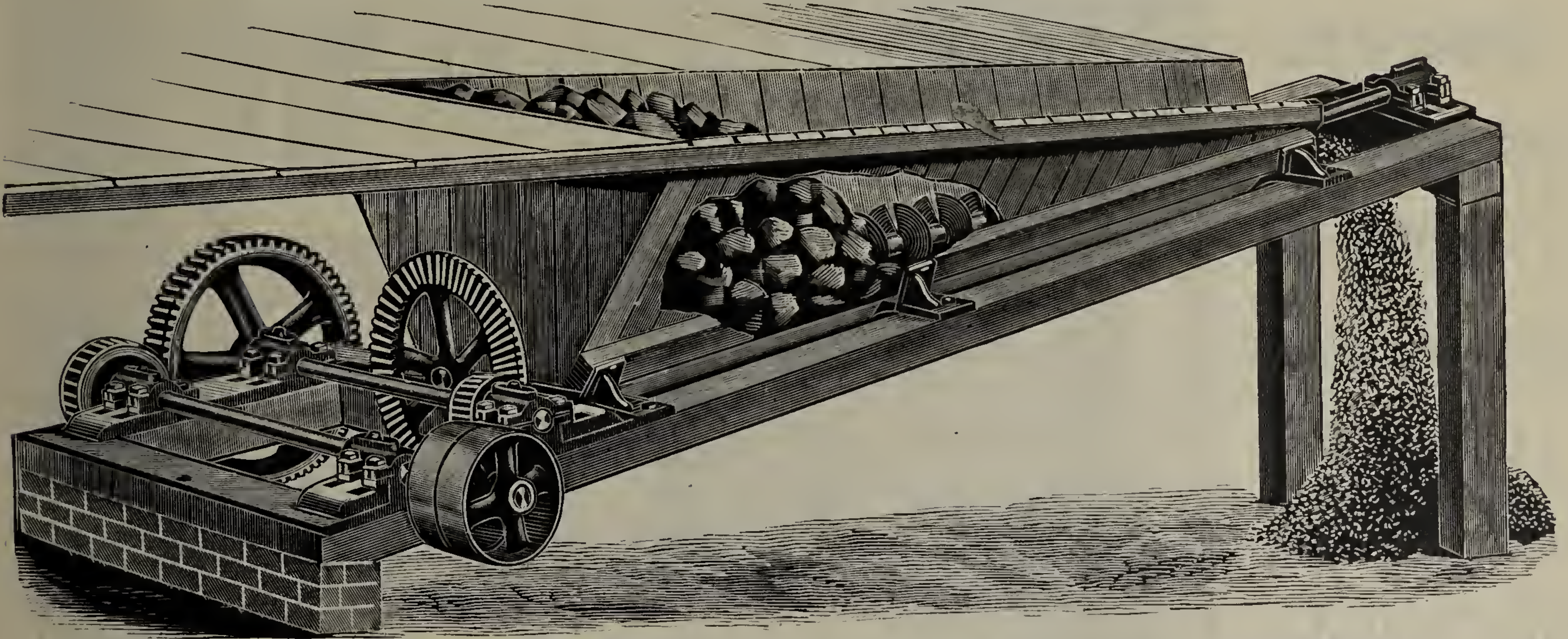
NO. 10 SPRING TRUCK.
(Weight 100 pounds.)



NO. 1 BRICK BARROW.
(Weight with springs 100 lbs.)

Emen's Patent Perfection Clay Granulator and Feeder.

SOLD SUBJECT TO TRIAL AND APPROVAL.



Saves time and labor and produces better ware; simple in construction; rapid and accurate in operation. Every brick, tile and sewer pipe manufacturer should investigate the merits of this machine.

During the past season it was introduced in several of the leading Chicago brickyards and is now at work giving entire satisfaction. Write for descriptive circulars.

Chambers Brothers Company, of Philadelphia, Pa., are licensed to manufacture and sell these machines.

EMENS AND COLE

HOLTON, (MUSKEGON CO.) MICH.

[Mention Clay-Worker.]

THE STANDARD BRICK MACHINES

—MANUFACTURED BY—

A. M. & W. H. WILES,

Grassy Point, Rockland County, New York.

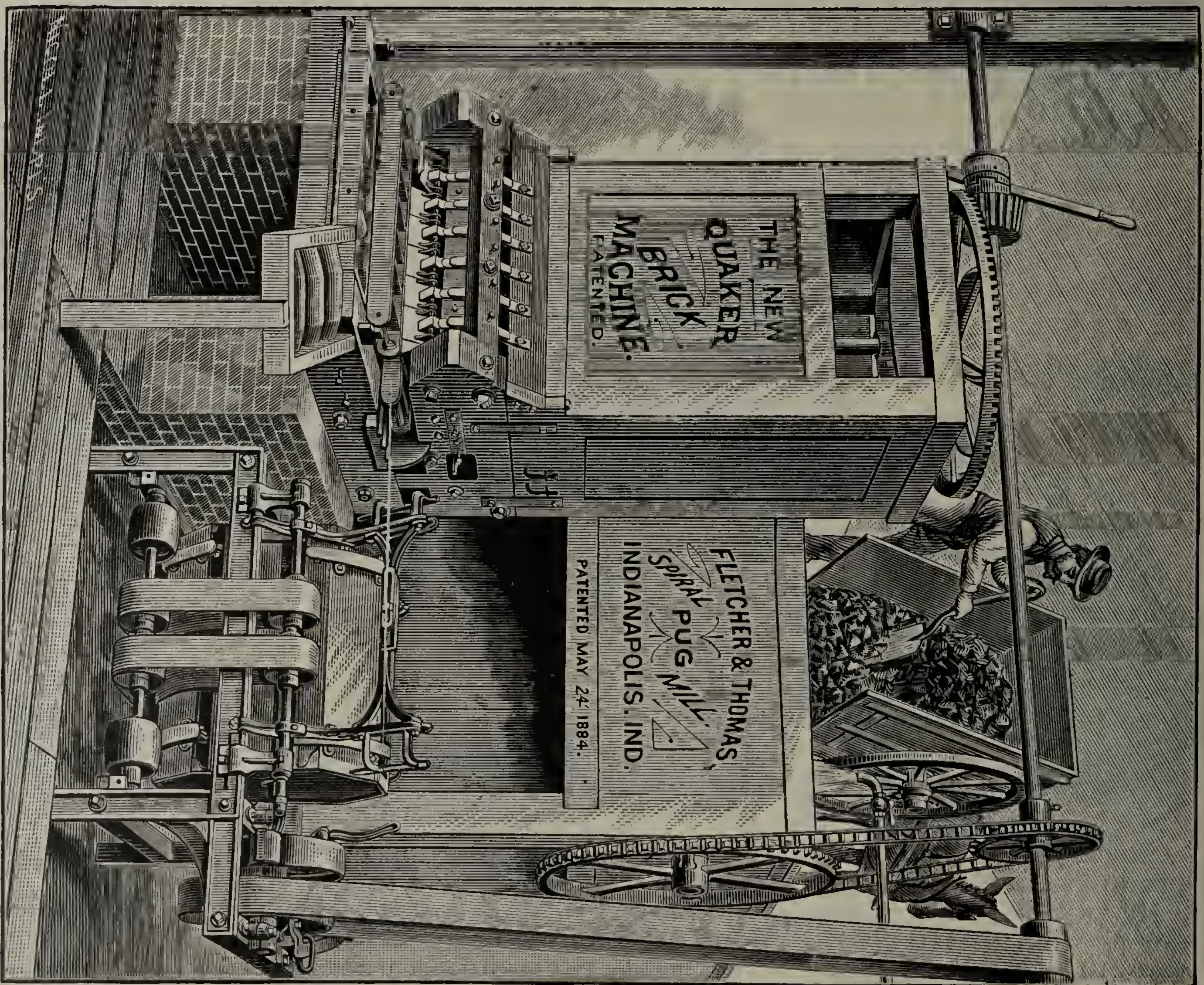
These Moulding Machines have been in constant use for over 30 years, and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

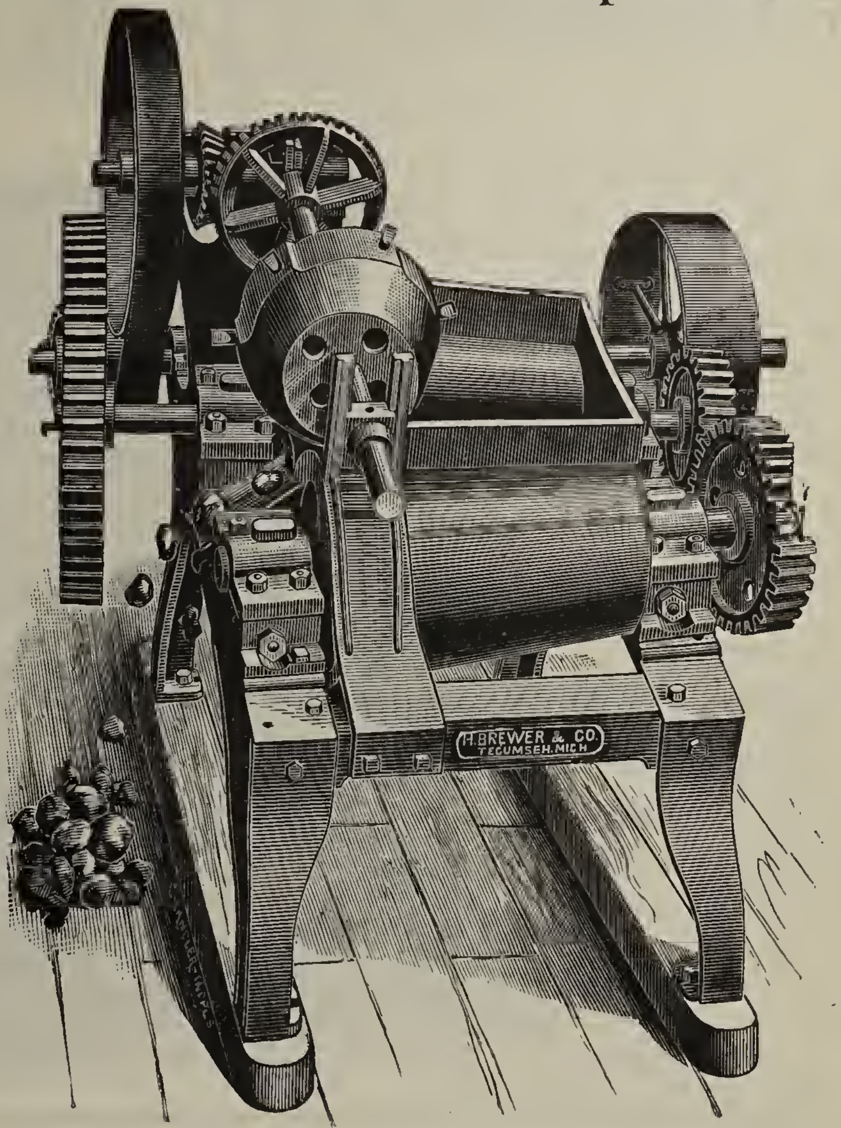
CORRESPONDENCE SOLICITED.


THE NEW QUAKER BRICK MACHINE. PATENTED.
FLETCHER & THOMAS, SPIRAL PUG MILL INDIANAPOLIS. IND.
PATENTED MAY 24 1884.

This outfit will make the largest number of the very best of Pallet Bricks at Least Cost of anything in the market. For further particulars address

BENNETT BROS. & CO., Wellington, Lorain Co., Ohio.

H. Brewer & Co's. Clay Crusher and Stone Separator.



The prominent feature in this Crusher is the combination of two smooth, tapering crushing rolls, running at different speeds, in connection with an adjustable transverse roll which is of irregular form and provided with teeth or spurs, whereby the clay is rapidly broken up and crushed, and the stones separated therefrom.

TESTIMONIALS.

Saunemin, Ills., May 18th, 1888.
H. Brewer & Co., Gentlemen—Your Crusher works to a charm and we are very highly pleased with it. It runs one-half easier than any other Crusher we have had.
Yours Truly,
SAUNEMIN BRICK AND TILE CO.

Budd, Ills., May 3d, 1888.
H. Brewer & Co., Dear Sirs—The Crusher and Elevator work to my entire satisfaction. I feel confident I would be $2,000 ahead, to-day, had I put in your Machine and Crusher at the start.
Yours Truly,
HENRY SIEDENTOP.

Monroe, Iowa, May 15th, 1888.
H. Brewer & Co., Gentlemen—The Crusher is giving good satisfaction and I think will do all that is claimed for it.
Yours,
T. P. BURCHINAL.

☞Do not fail to obtain our prices on Tile Machines, Brick Machines, Pug Mills, Clay Crushers, etc. For illustrated Catalogues and Price List, address

H. BREWER & CO.,

(Mention Clay-Worker.) **Tecumseh, Mich.**

STEDMAN'S IMPROVED

Disintegrator and Pulverizer.

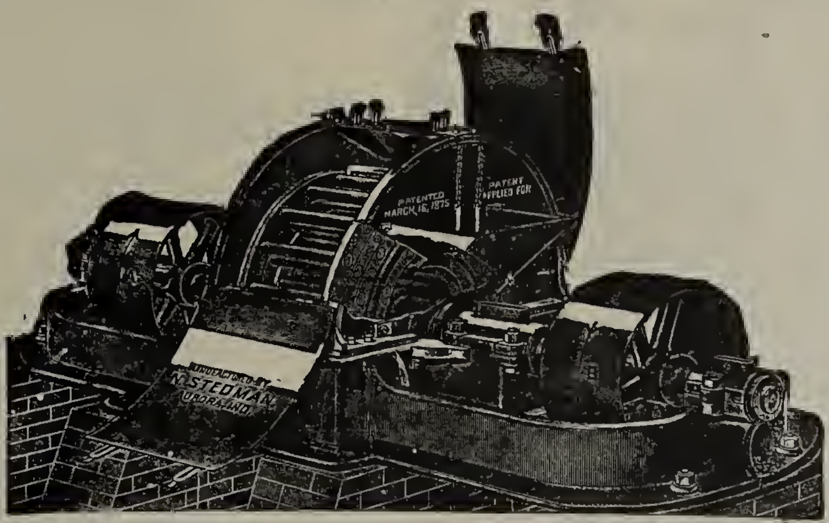
This mill will disintegrate or pulverize the following materials:

Clays of all kinds, Shale and Slate direct from the bank, for Brick and Tile.

Fire Clay and Sand Stone Rock—for Cement and Fire Brick.

Iron Ores of various kinds, Guano, Phosphates, Bones—green, dry steamed, Tankage, Rone-Ash, Salt Cake, Soda, Cracklings, Oyster Shells, Animal Matter in almost all conditions, Old Fire Brick and Tiles.

Old Pottery Ware, Plastic Clay, Asbestos, and in fact almost any material that can be disintegrated.



A good Disintegrator and Pulverizer is a long felt want in many branches of business. This Mill is an improvement over any yet made and is the result of practical experience.

This Mill is made in three sizes: 34, 40 and 48 inches. The capacity for clay is as follows:

34 inch Mill will pulverize for from 15,000 to 25,000 brick per day.
40 inch Mill will pulverize for from 20,000 to 35,000 brick per day.
48 inch Mill will pulverize for from 75,000 to 100,000 brick per day.

To Brick, Tile and Pottery Men and to Terra Cotta Works this Mill Is invaluable. It reduces the clay to a fine, light and soft condition, with its full adhesive properties retained.

For Prices and any other Information, Address

Stedman's Foundry and Machine Works,

PROTECTED BY PATENTS.
[Mention the Clay-Worker.]

AURORA, IND.

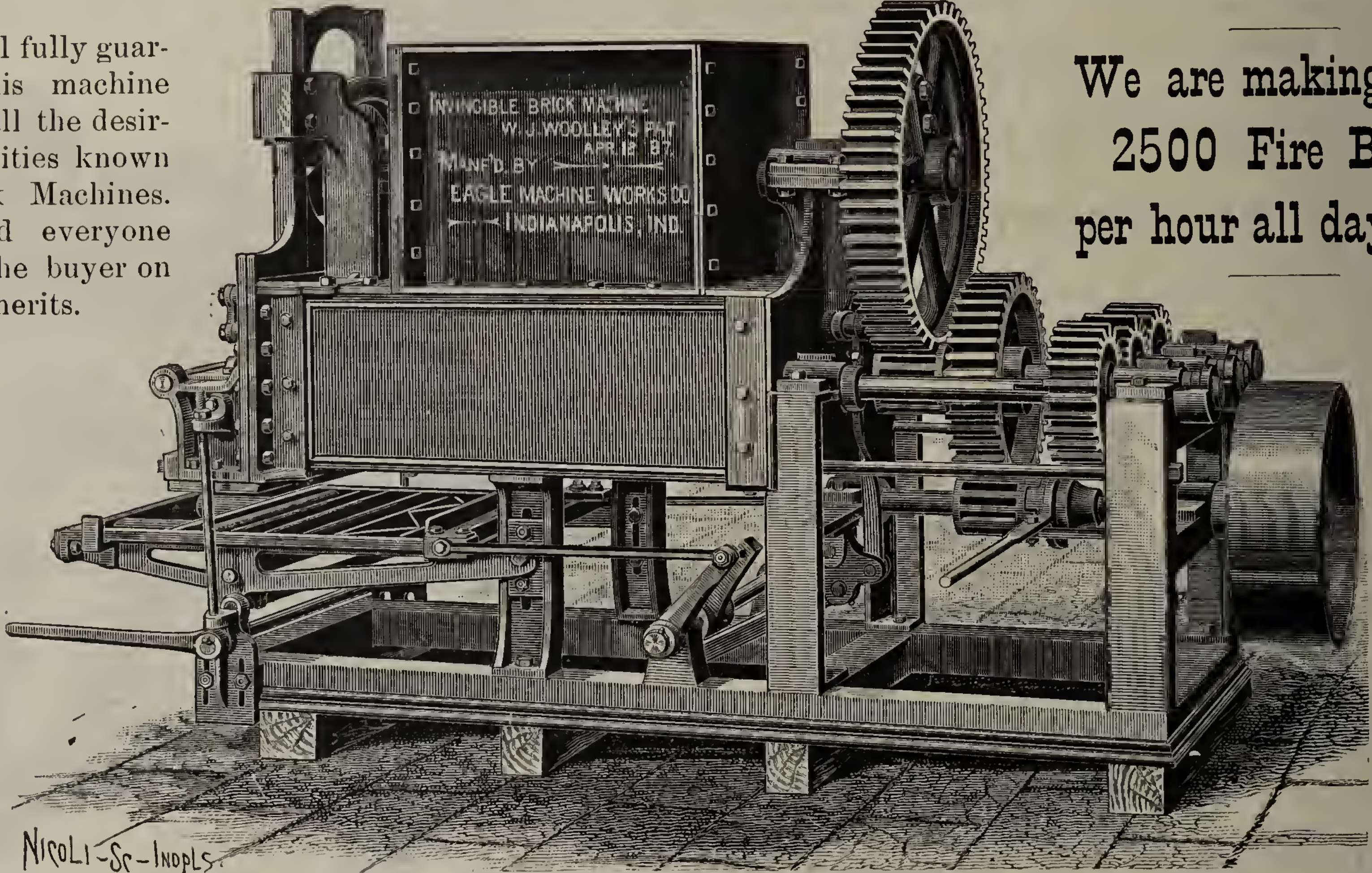
The Invincible Brick Machine.

The STRONGEST, MOST DURABLE and BEST BRICK MACHINE in the market. Write for full description, prices, etc., to

EAGLE MACHINE WORKS CO., Indianapolis, Ind.

We will fully guarantee this machine to have all the desirable qualities known in Brick Machines. Each and everyone put to the buyer on its own merits.

Nothing Equals It.



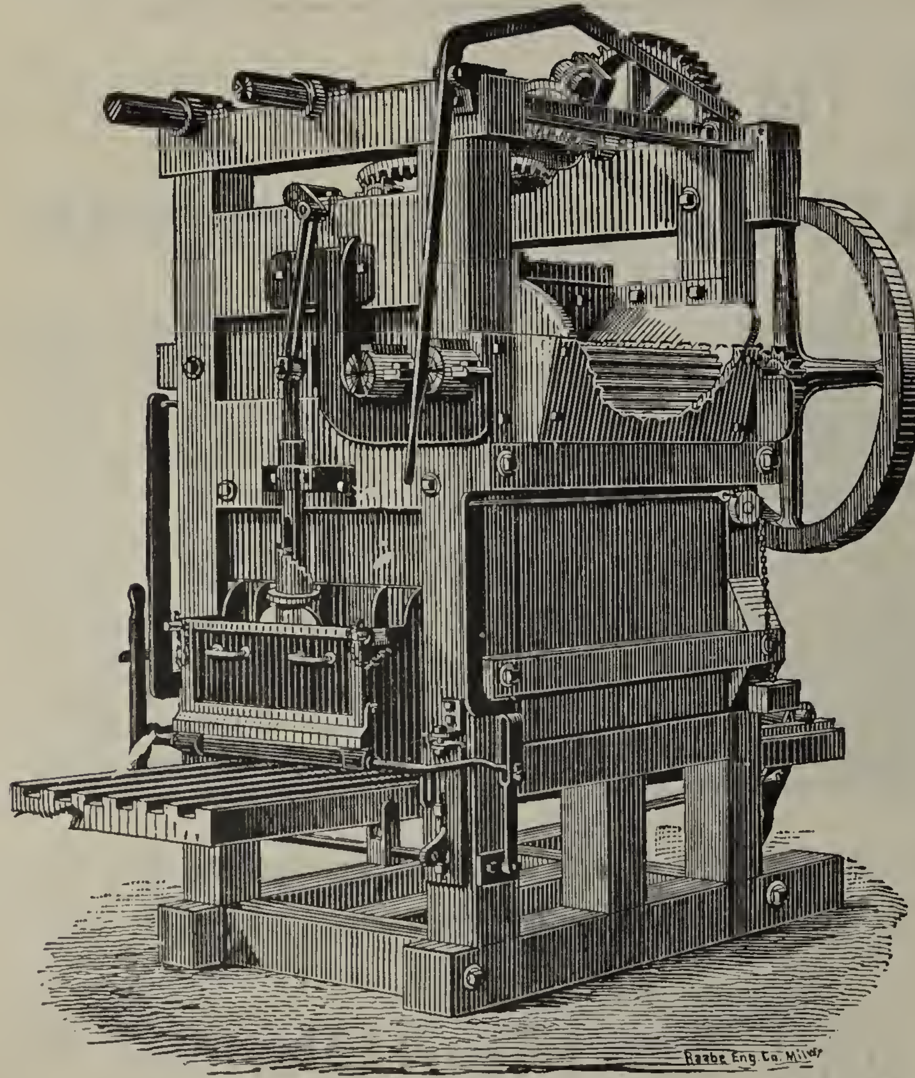
We are making over 2500 Fire Brick per hour all day long.

GURNEY
BRICK MACHINE WORKS,
MILWAUKEE, WISCONSIN,

Manufacturers of

THE GURNEY BRICK MACHINE

—Having Crushers Inside of Pug Mill.—



THIS is the only Machine in use which has the *combination of Crushers, Mixing and Moulding Apparatus* in a single machine. The arrangement is covered by patent issued October 6, 1885.

This machine will work any clay, however hard and lumpy, with no preparation before soaking in the usual way. The Crushers will take the clay through as fast as the machine will turn out the brick, *doing entirely away with lumps*, which brickmakers know have been much in the way of making good brick, and also have caused great loss by breakage.

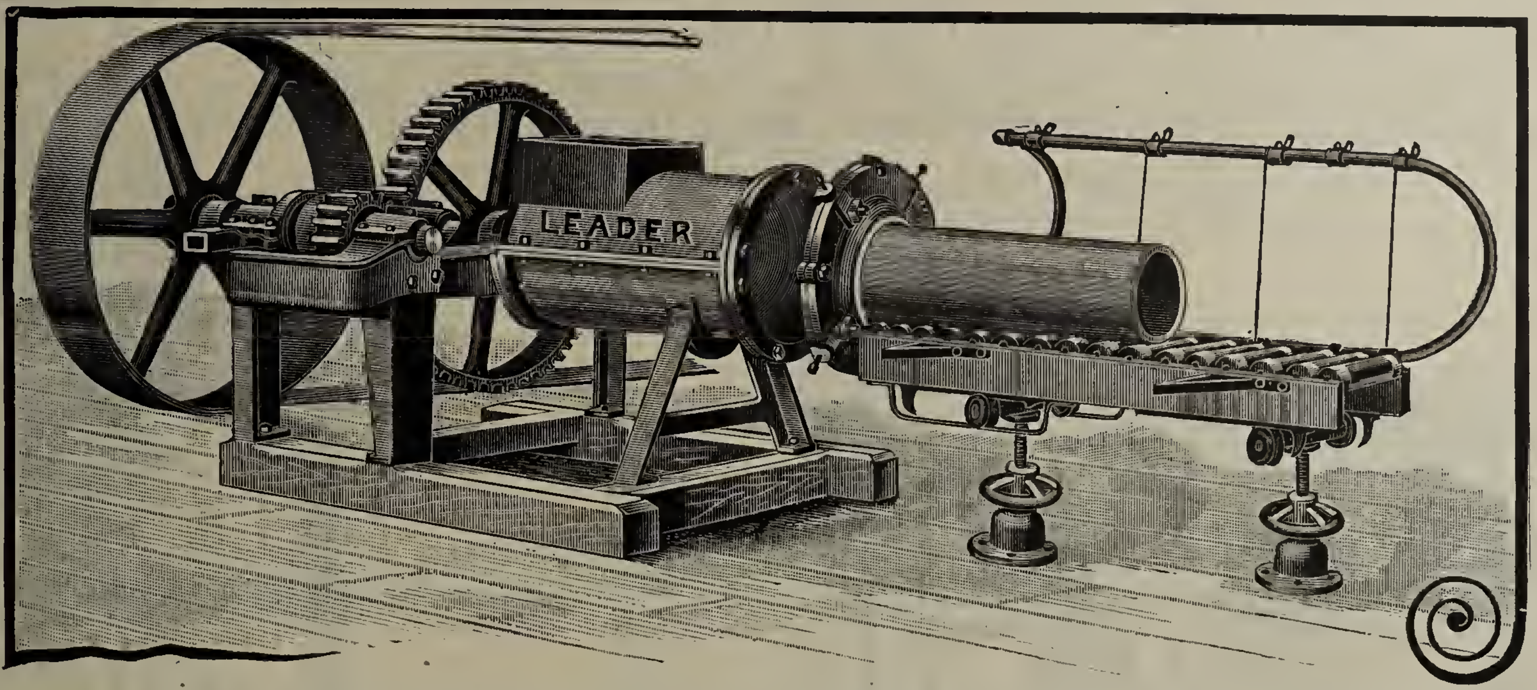
The Machine will turn out four thousand, or more, good, smooth, square brick an hour. With proper moulding sand THE BRICK FROM THIS MACHINE, *made from any clay*, WILL SLIP EASILY. The Machine has been thoroughly tried in different parts of the country.

Also First-Class STEAM and HORSE-POWER MACHINES of same pattern, without Crushers.

For further information and Illustrated Catalogue address—

T. C. GURNEY,
100 Wisconsin St., MILWAUKEE, WIS.

THE LEADER BRICK AND TILE MACHINE.



We manufacture the very latest and best designs of Tile Machines, Brick Machines, Clay Crushers, Elevators, and Dump Cars for handling clay by steam. Design special clay-working machinery to order. Have a large stock of the best cutting wire. Correspondence solicited.

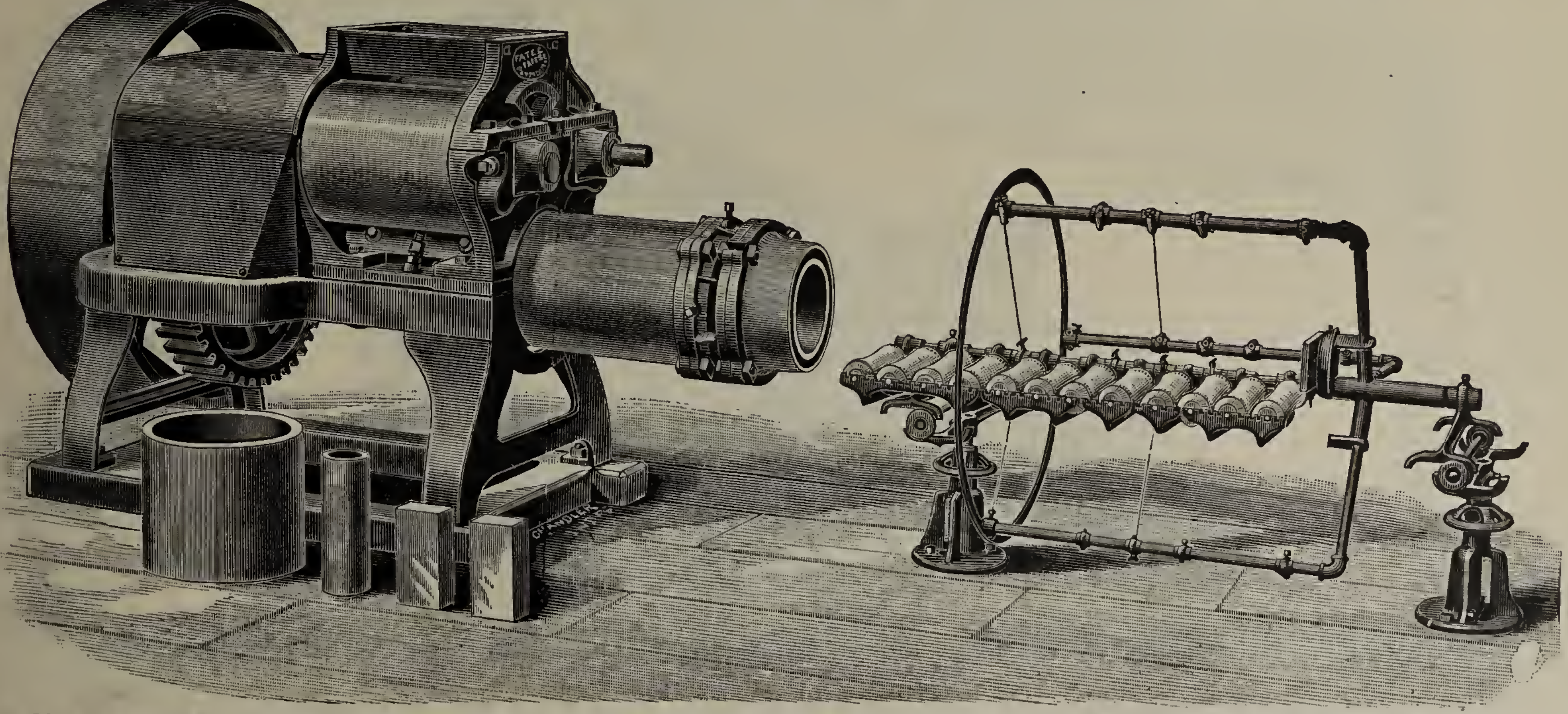
BROWN & HARROP MFG. CO.,

Geo. S. Pollock, Agent, Sullivan Ind

PORTLAND, IND.

THE OHIO BRICK AND TILE MACHINE.

Unequalled for Rapid and Perfect Work!



Most simple, durable and convenient in use. Side or end cut brick. Tile up to 15 inches. We have the latest and most approved Cutting Tables. Satisfaction guaranteed. Factory outfits furnished. Address

FATE & FREESE,

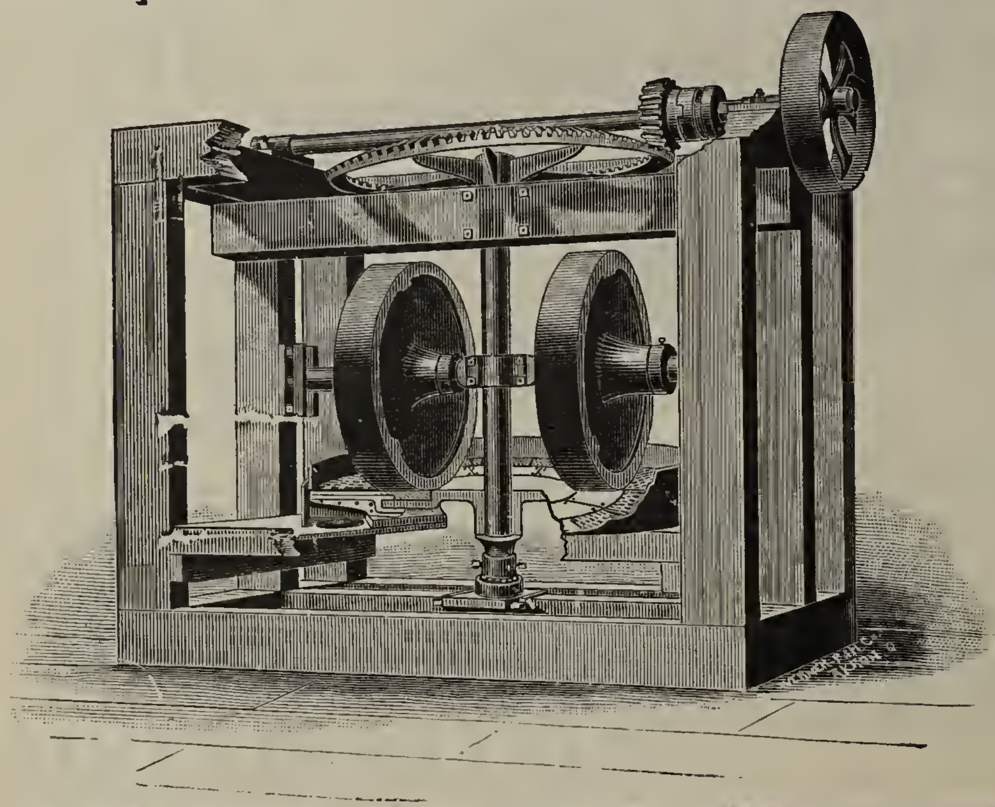
Send for particulars.

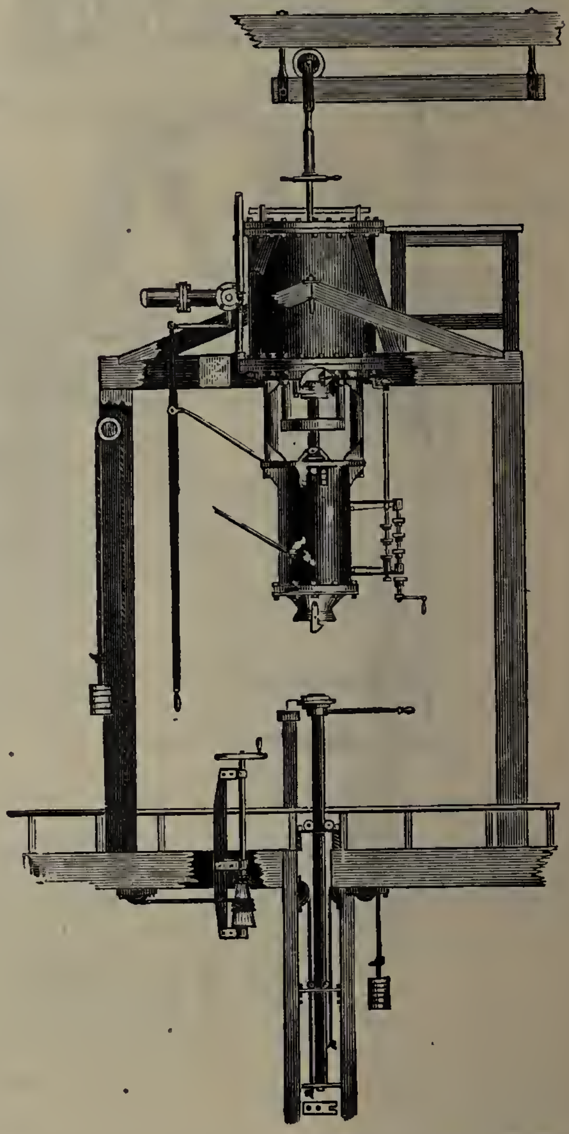
PLYMOUTH, OHIO

TAPLIN, RICE & CO.,

AKRON, O.

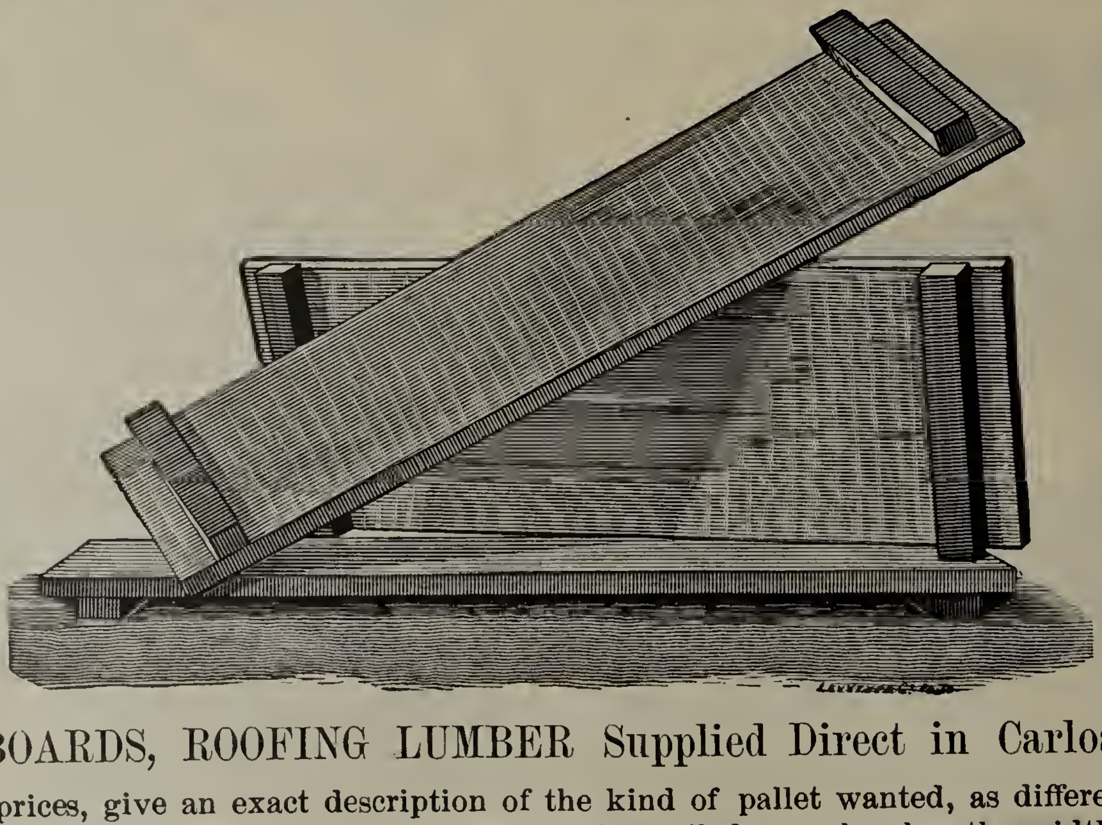
Manufacturers of Improved Clay Working Machinery of all kinds, such as Clay Mills, Dry and Wet Pans, the Barber Steam Sewer Pipe Press, Dies, Clay Blockers, Potters' Wheels and machinery of every description. Write for circulars.





BRICK PALLETS.

Brick Pallets.



Brick Pallets.

PIPE BOARDS, ROOFING LUMBER Supplied Direct in Carload Lots.

When writing for prices, give an exact description of the kind of pallet wanted, as different pallets are in use in different sections of the country. State whether cleats are to be nailed on; also length, width and thickness of the pallet. We have a big trade in this line and can save you one profit. Write for prices.

W. B. MERSHON & CO.,

Manufacturers of all kinds of white pine lumber and packing boxes in shooks.

East Saginaw, Mich.

THE PENFIELD STIFF CLAY MACHINES

Are UNEXCELLED For the Manufacture of

COMMON BRICK, FACE BRICK, ORNAMENTAL BRICK,

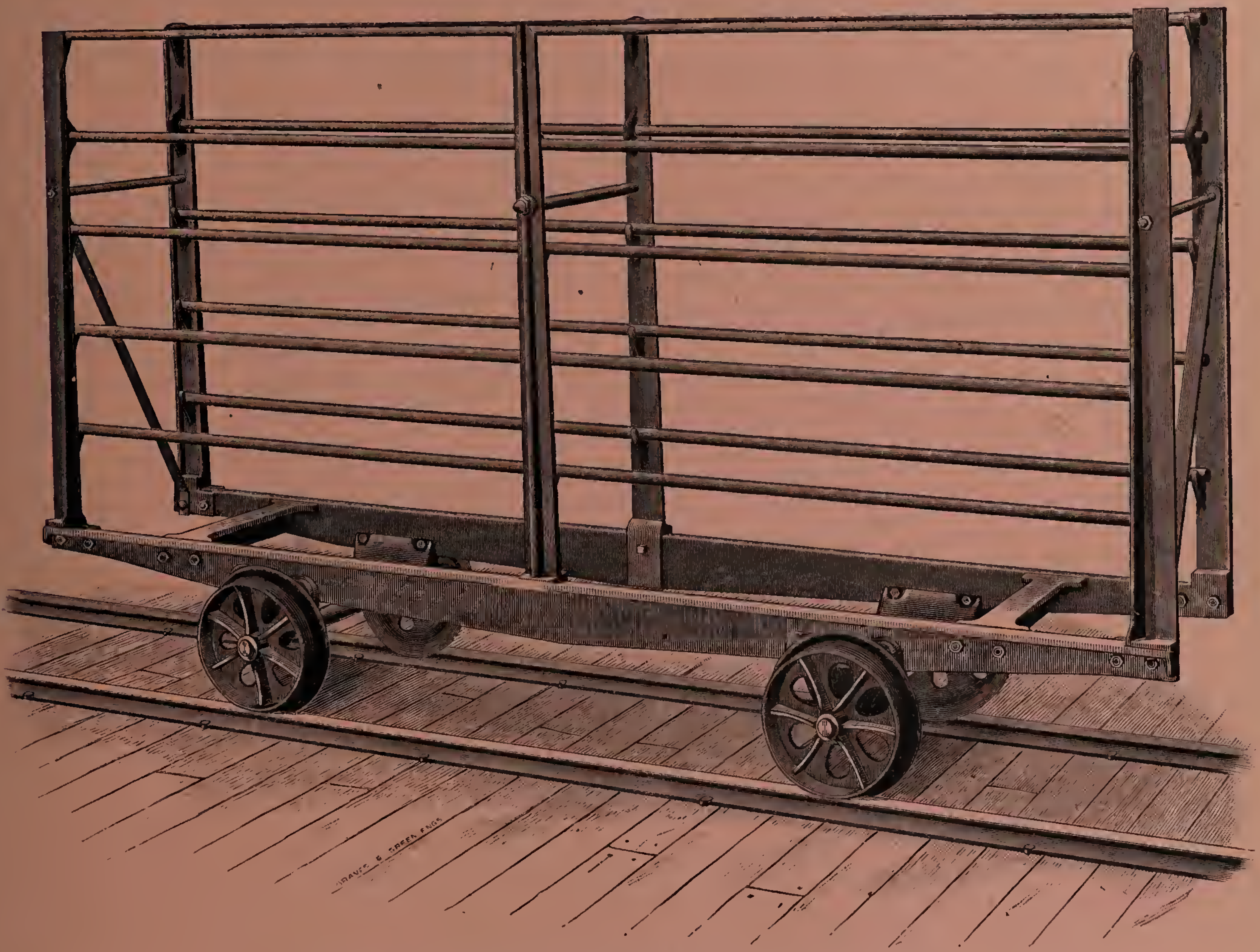
Paving Brick,

FIRE PROOF BUILDING MATERIAL, TERRA COTTA LUMBER.

Machines of all Capacities, from 15,000 to 80,000 per day.

Complete Outfits a Specialty.

We handle Engines and Boilers. Our Patented Steam Drier is the Best.



Iron Dry Car with Pipe Rack for Flat Pallets.

We make a full line of Iron Dry Cars, single or double decked, Transfer Cars, Turn Tables, Etc., for Any Dryer. Write for particulars.

—WE MANUFACTURE—

Brick Machines; Tile Machines; Pug Mills;
Clay Crushers and Stone Separators; Granulators;
Elevators; Kiln Castings; Yard Supplies.
Pulleys, Shafting, Hangers, Couplings, Etc., Etc.

☛For full particulars address the manufacturers,

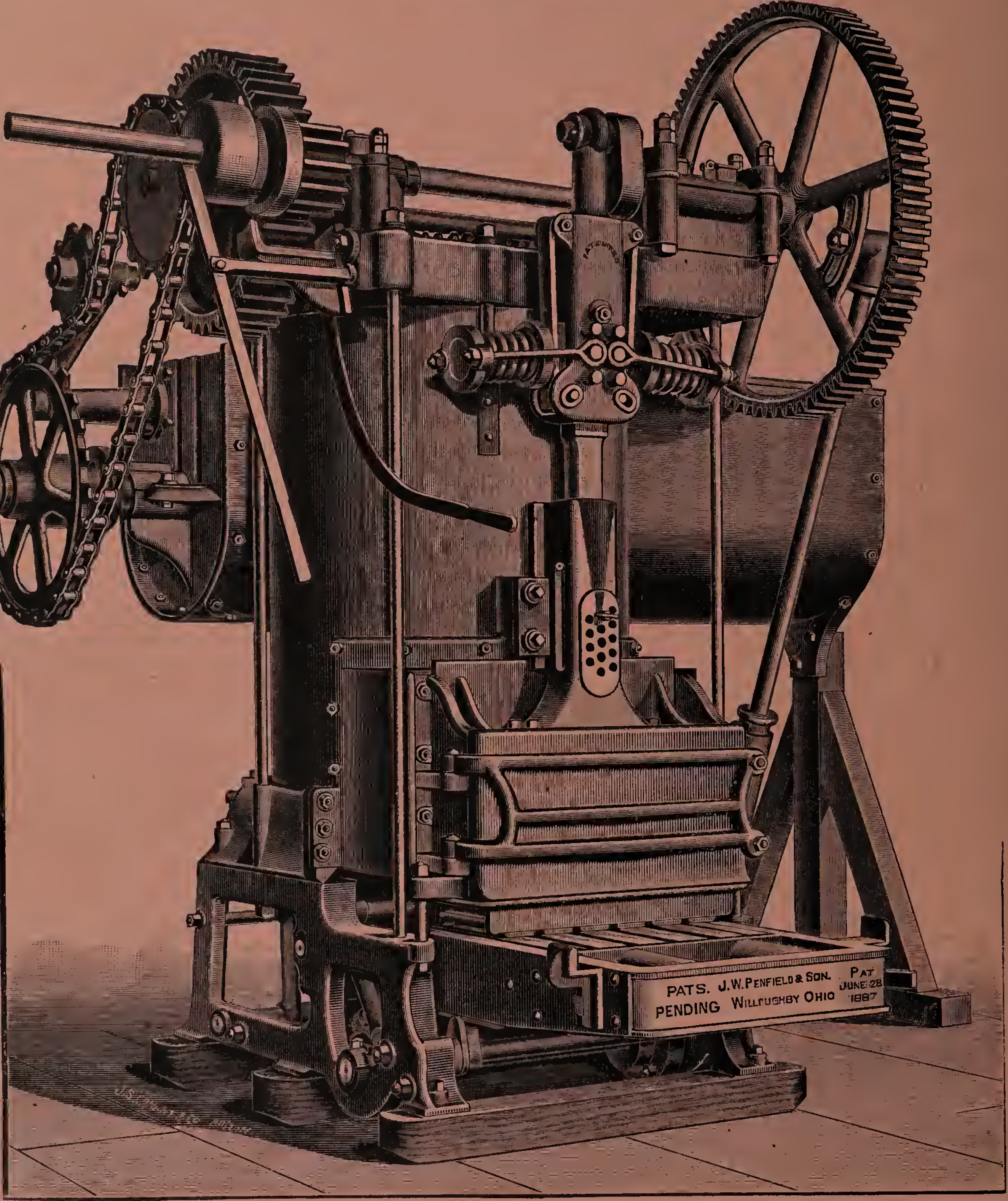
J. W. PENFIELD & SON,
WILLOUGHBY, OHIO, U. S. A.

[Mention the Clay-Worker.]

THE PENFIELD
Upright Stock Brick Machine.

WITH DIRECT-ATTACHED PUG MILL.

Every Brickmaker should send for full particulars of this machine.



This Machine is furnished with or without pug mill, as desired.

The Strongest, Most Practical and BEST Sand Moulding Machine made.

All Iron and Steeel; No wooden parts to decay; Extremely heavy; Perfectly rigid; Light running; Has separate gearing for doing the pressing and pugging; Makes **six** of the largest sized brick in each mould.

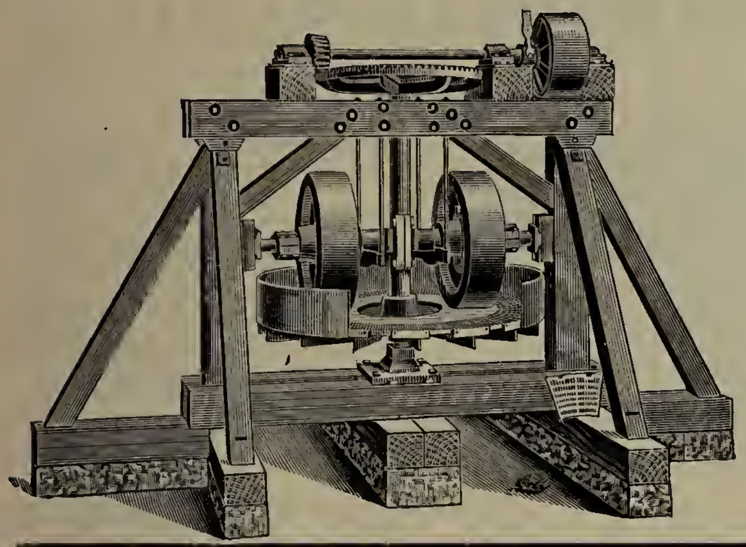
All the brick are perfect in shape, with good sharp corners, in fact **perfect stock brick.**

All the brick are of equal density, and if repressed will make first-class pressed brick, **ALL UNIFORM IN SIZE.** Address the Manufacturers,

J. W. PENFIELD & SON,

[Mention the Clay-Worker.] WILLOUGHBY, OHIO, U. S. A.

THE FROST
Dry & Wet-Pan Crushers, Chasers, Etc.,



—FOR—

BRICK, TERRA-COTTA, SEWER PIPE AND FIRE CLAY.

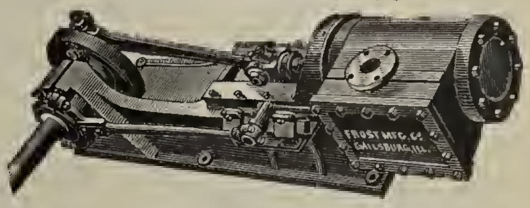
—o—

The best and cheapest machines made for working hard clay, soap stone, grog, etc.

Write for prices and other information.

THE FROST ENGINE CO.

GALESBURG, ILL.
ALL SIZES UP TO 150 H.P.

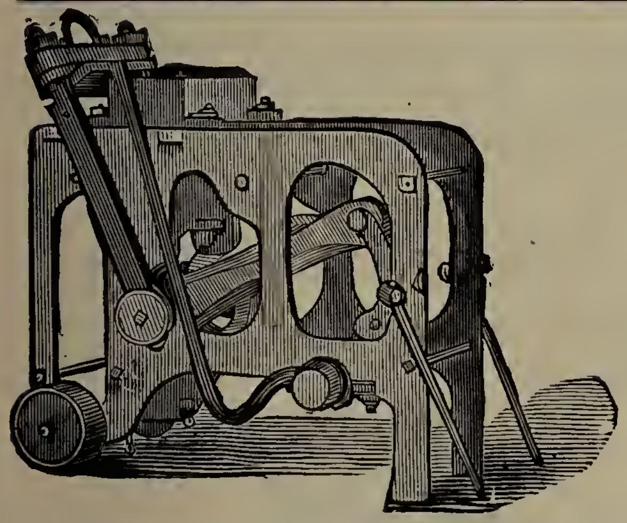


FROST MFG. CO. GALESBURG, ILL.

ELEVATOR SUPPLIES

PULLEYS, SHAFTING, SPROCKETS, BUCKETS, BELTING, SHELLERS, CLEANERS, MILLS, &c.

SEND FOR CATALOGUES



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1819 and 1821 Germantown Avenue,
and Fifth St.,
PHILADELPHIA, PA.

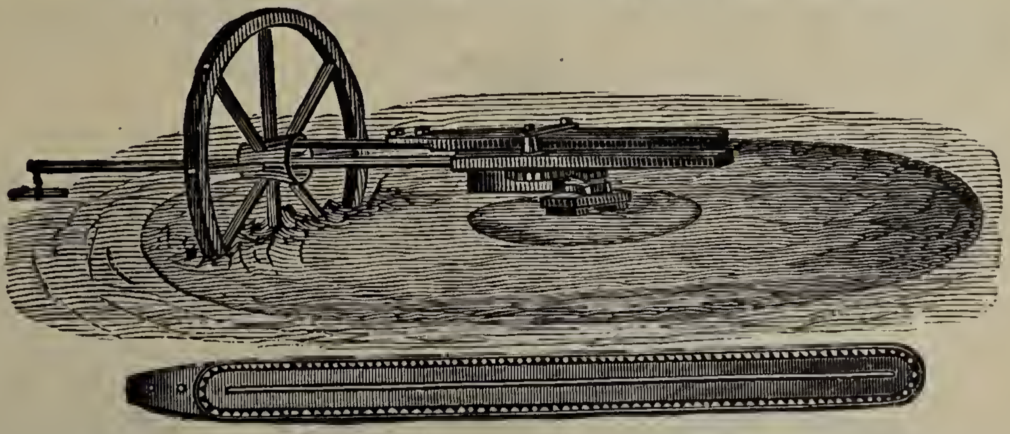
☞Send for Circular and Price-List.

Philadelphia Brick Machine Works

—MANUFACTURER OF—

FIRE AND RED BRICK PRESSES.

Various sizes, from the smallest size up to 24 inches; also, manufacturer of **Clay Mills, Tempering Machinery,** and all kinds of **Brickmakers' Tools.**



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and is fitted up ten per cent. cheaper. ☞Mention THE CLAY WORKER

ESTABLISHED 1812,
AND CONTINUED ON THE SAME PREMISES EVER SINCE.

MILLER'S
BRICK PRESSES,

Introduced 1844 Latest Improved Patents, Aug. 28, 1883.

SAMUEL P. MILLER & SON,

MAUFACTURERS OF

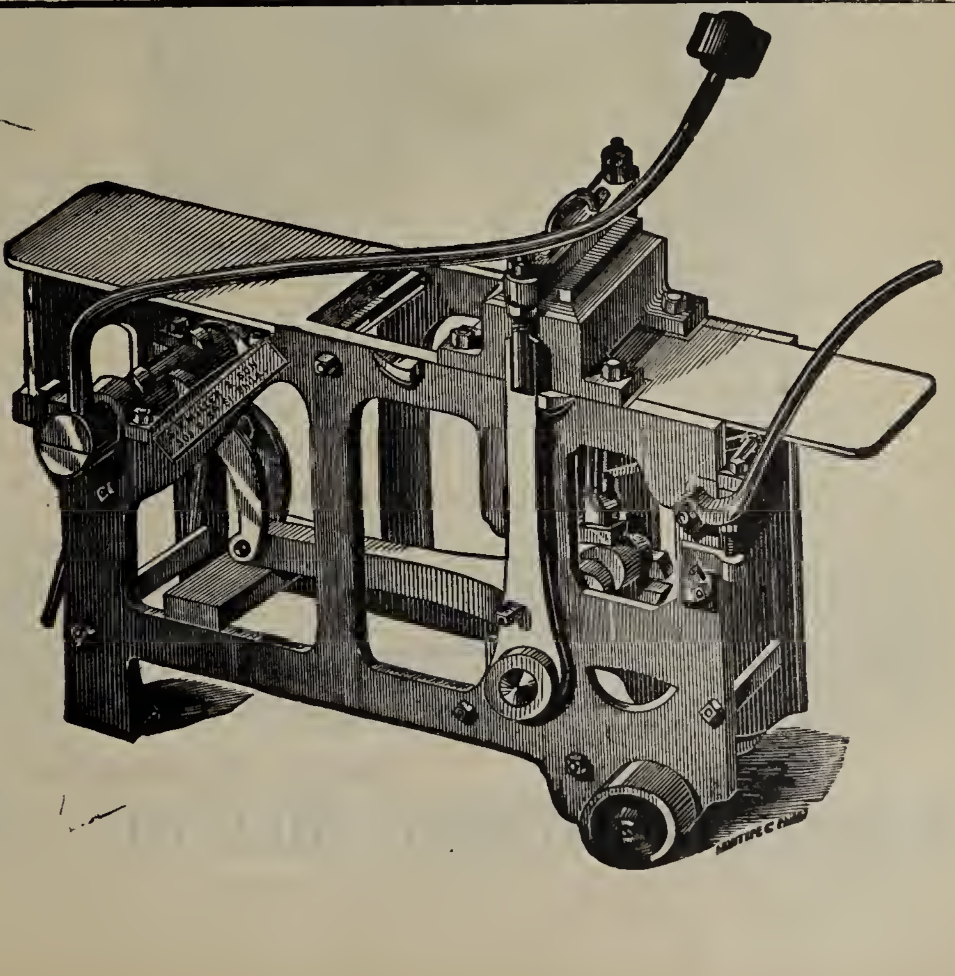
RED AND FIRE BRICK PRESSES,

Of five different styles, embodying all the improvements in Hand Brick Presses in use.

Clay Wheels with Reciprocating Rack, Kiln Castings, Brick Moulds, Clay Spades, and the Tools in General Use for Brick Making.

No. 309 SOUTH FIFTH ST., PHILADELPHIA, PA.

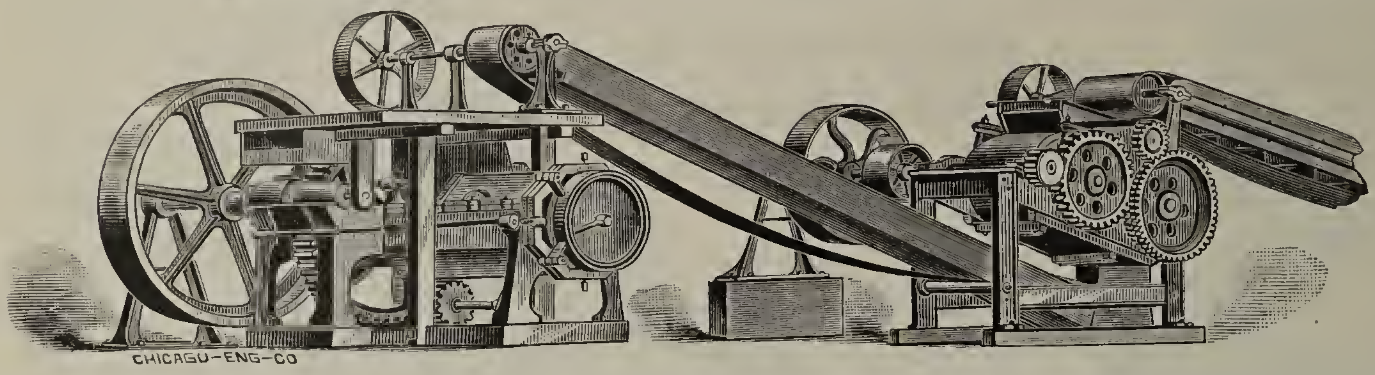
S. P. M. & Son refer to Brickmakers generally. ☞ Orders from abroad promptly attended to.



Adrian Brick and Tile Machine Co., Adrian, Mich.,

—MANUFACTURERS OF—

Brick and Tile Machinery,



Clay Crushers,
Engines
and boilers.

Also Daso's Builders' and Contractors' Elevators. Steam Fittings and Iron and Brass Castings Furnished to Order.

The working qualities of our machinery at its present state of development as estimated by one of the prominent Brick Manufacturing Companies of Kansas City, are stated in the following reply to a letter of inquiry addressed to them:

KANSAS CITY, MO., August 21, 1888.

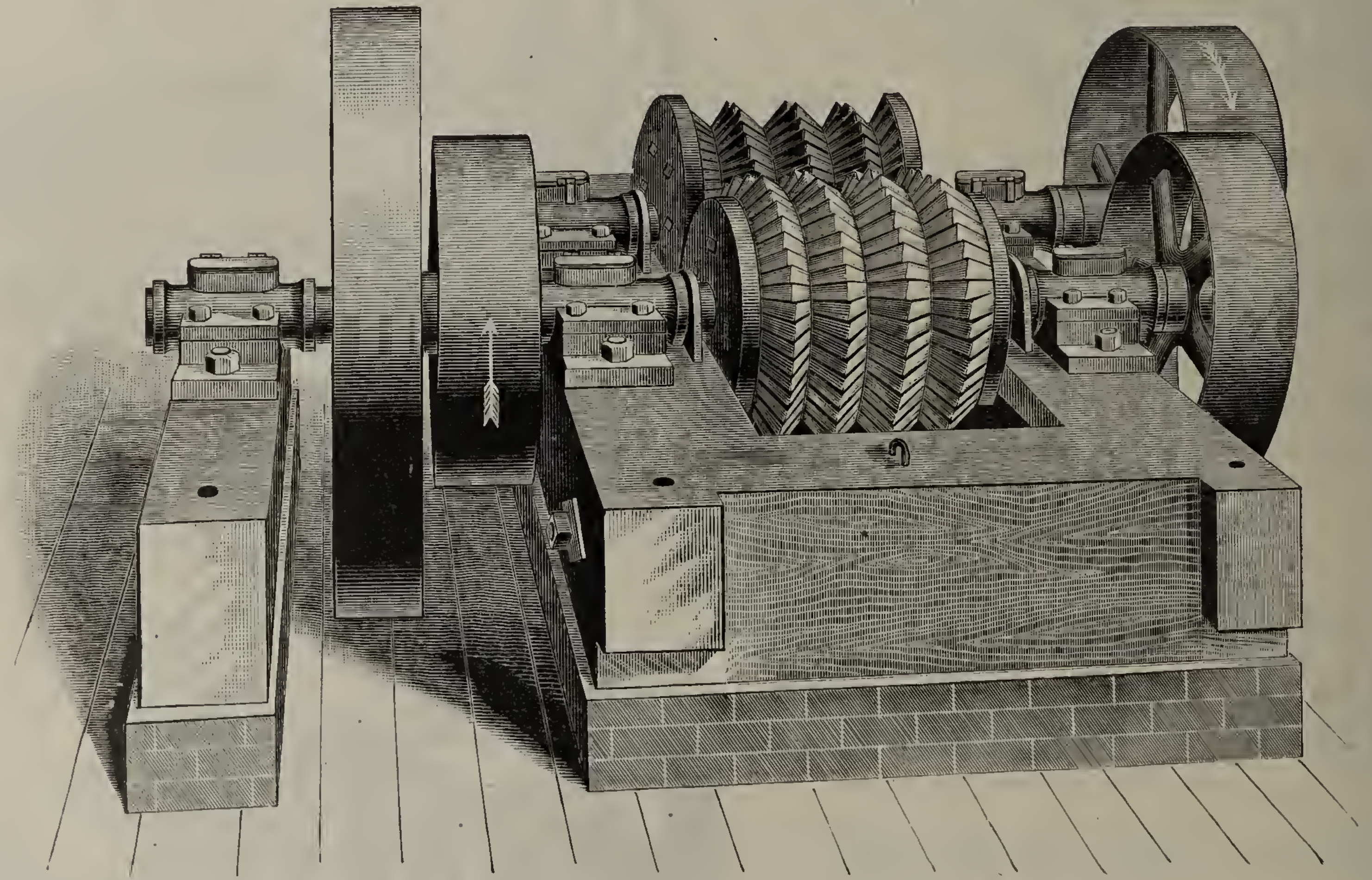
JOHN GIBSON, Esq., Monticello, Iowa:

DEAR SIR—In answer to your favor of the 16th will say, that we do not think there is any room for improvement in the Adrian Brick and Tile Machine Co's No. 4 Cut-off Table, as it cuts the brick as near perfect as possible, without tearing the edges; thus leaving the ends of the brick as perfect as the face. We are also using the new dies on both our machines, and are well pleased with them, as they are 100 per cent. better than the old style and turn out a perfect column of clay without warping or twisting. We have two No. 3 McKenzie machines and they are doing excellent work for us and we averaged during July, 26,800 brick, each, per day. In conclusion we will say that both the new tables and the new dies are so incomparably superior to the old ones that it gives us much pleasure to recommend them.

Very truly yours, SEDDON & EDWARDS BRICK CO.

NEWELL IMPROVED CLAY PULVERIZER

We Guarantee the Material and Workmanship and allow a Trial of our Machine to any Responsible Party.



NEW 19-INCH LETTER C PULVERIZER, WITH HOPPER REMOVED.

Heavy Cold Rolled Shafts running in best Anti-Friction Metal Bearings, protected from dirt.

A FEW OF OUR CUSTOMERS AND REFERENCES:

Henry Maurer & Son, (3 Pulverizers) 420 E. 23rd St., New York City.
Peerless Brick Co., Philadelphia, Penn.
Perth Amboy Terra Cotta Co., (2 Pulverizers) Perth Amboy, N. J.
Syracuse Pressed Brick Co., Syracuse, New York.
Potomac Terra Cotta Co., (2 Pulverizers) Washington, D. C.
Siner & Brother, Frankford, Penn.
W. H. Perot, Baltimore, Md.
The Rathbun Co., Deseronto, Ontario, Canada.
Murrill Dobbins, (3 Pulverizers) Philadelphia, Penn.
American Brick & Tile Company, Phillipsburg, New Jersey.

Send for Illustrated Circular and Price List

NEWELL UNIVERSAL MILL CO., - 10 Barclay St., NEW YORK.

THE **Jos. J. Kulage Press Brick Machines** Patented 1884, 1886, 1888.

Yield DOUBLE the Pressure of any other Brick Press (excepting the "Hydraulic") and are marvels of perfection.

A NEW ERA IN MAKING PRESS BRICK.

EVERY BRICK MANUFACTURER who intends or is making "Dry" or "Semi-Dry" Pressed Brick neglects his interests, if he fails to visit or correspond with the undersigned in regards to his system and machines. Works in operation day and night, all year (excepting December and January). Capacity: Daily 140,000 Bricks.

Our Fancy, Front and Stock Bricks are the only DRY-PRESSED Bricks made in the United States that are equal and SUPERIOR to those of the St. Louis "Hydraulic". We want a reliable Representative for the sale of our bricks in every large city.

JOS. J. KULAGE, President
College Hill Press Brick Works,

WORKS, near O'Fallon Park St. Louis, Mo.
OFFICE, 1435 College Avenue, ST. LOUIS.

THE NEW IMPROVED
CHIEF BRICK MACHINE.

Patented Jan. 1, 1884, *April* 2, 1884, *and the new improvements of* 1887 *and* 1889.

Has taken the lead and stands at the head of all Brick Machines, and is now in operation in every State and Territory in the Union.

In its original construction it was exhibited and operated at the great Southern Exposition at Louisville, Ky.; also at St. Louis, Mo., Kansas City, Mo.; Indianapolis, Ind.; Columbus, O.; Cincinnati, O.; Chicago, Ill.; and at each and all places where premiums were awarded the CHIEF carried off the first prize medal over all competitors.

And with the late new improvements added the CHIEF stands in perfection, at the head of human inventions.

The NEW IMPROVED CHIEF is wonderful in operation, is all steel and iron, and of the greatest strength and durability, is easily operated, and with two horses or a small engine makes 60 to 100 perfect bricks per minute. Grinds, tempers and at the same time moulds into brick any clay. Stones in clay cannot break it, nor interfere with its free operation. It is easily transported, and changed from horse to steam power. It fills the moulds evenly and well until the machine is empty of clay, pressing each brick equally and solid, so all will shrink alike. The pressure can quickly be changed while the machine is running to suit the consistency of the clay. All shafts are of steel; main shaft runs in three boxes or bearings all outside of the machine into which mud or sand cannot penetrate. The wear can at all times be taken up so as to prevent leakage. The clay in the press box is under full control of the plunger, which is direct and positive, and prevents the mud from floating back into the mud drum; this feature is not found in any other mud machine.

Bricks made by the NEW IMPROVED CHIEF, are solid and perfect, and have sharp edges and corners, and do not crumble in burning.

The NEW IMPROVED CHIEF is equally suitable either for small or large yards, the best of bricks are made by it at the least labor and expense, all parts are easy of access and the bearings can be oiled from the outside. All ordinary sizes of brick as well as ornamental brick can be made on the NEW IMPROVED CHIEF and it is especially adapted to making fire brick of any shape with the least danger of breakage and the smallest per cent of lost brick.

The NEW IMPROVED CHIEF is sold on its merits, and warranted to be all that is claimed for it.

We will send Circulars and Testimonials of the NEW IMPROVED CHIEF BRICK MACHINE, New Departure Tile Machine, Engines, Etc., Etc., free to any address on application. Address

Anderson Foundry & Machine Works,

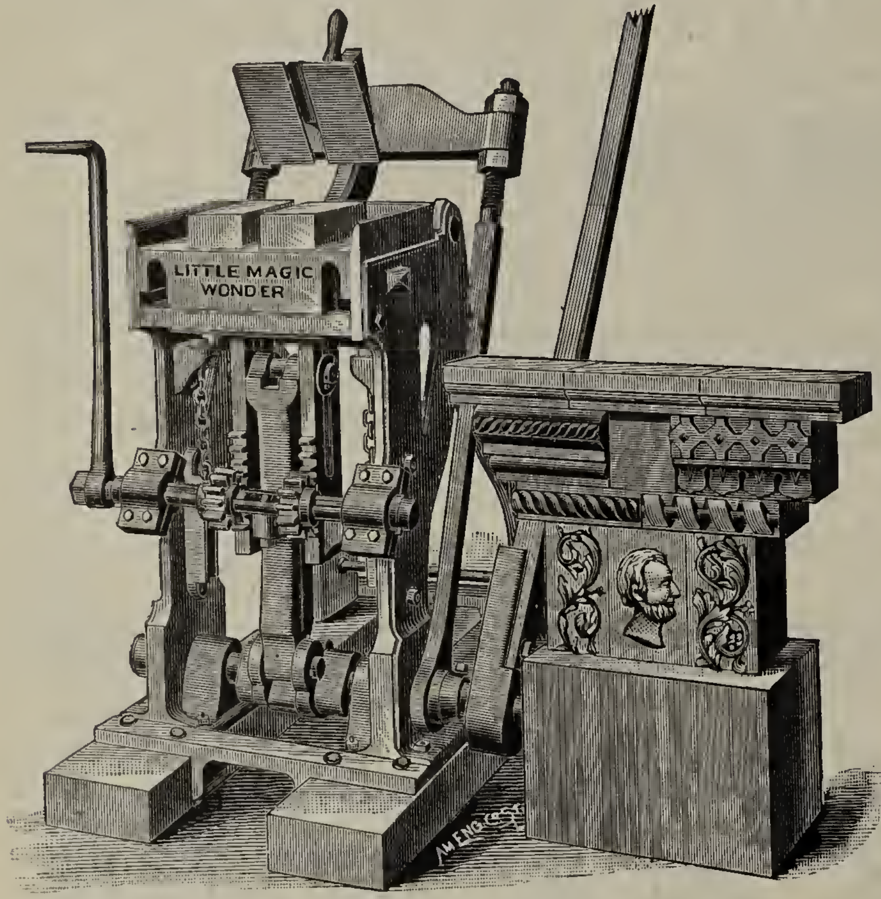
Mention the Clay-Worker.

Anderson, Indiana.

The LITTLE MAGIC WONDER

It Will Do It!

Over 1,000 Different Patterns of Ornamental Bricks Can Be Made on this Wonderful Press.



Hear What a Prominent Brickmaker Says:

St. Louis, Feb. 3d, 1889.

Mr. Wm. Thaison, Austin, Texas:

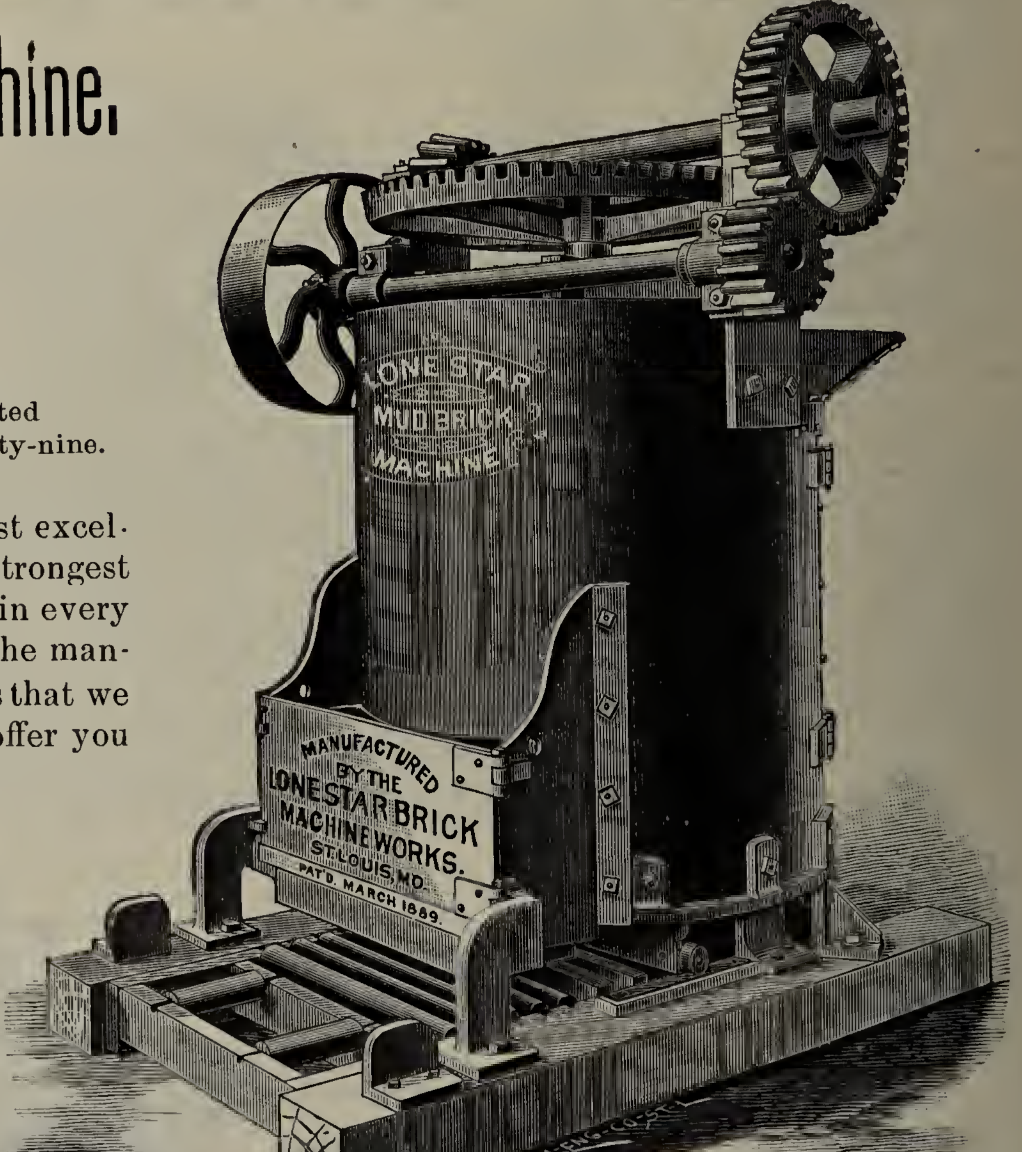
Dear Sir—At the end of a fair and satisfactory trial of your Little Magic Wonder Dry Clay Hand Brick Press, it affords me great pleasure to testify to its efficiency for the purpose intended. I had long been looking for just such a Press, whereon at short notice and at very slight expense we could, within a few hours' time get out small orders for ornamental bricks of special designs and patterns without interfering with the operation and working of our regular machines. The great value of your Hand Press to me, lies in the fact that we can make bricks upon it by pressure on edge as well as flat wise, thus enabling one to make almost any conceivable design of fancy moulded ornamental bricks. As you let your machines go out on trial there can come no loss to parties intending to purchase.

Very Respectfully, Anthony Ittner.

Mr. Ittner runs two of these machines. His reputation as a gentleman and an expert brickmaker is so well and favorably known to the readers of the Clay-Worker that further comment is unnecessary.

The Lone Star Soft Mud Machine.

Here is something new,
That's intended for you,
It's rather a trick,
For the making of brick,
Both handsome and fine
The best of its kind
Has just been invented
In March eighty-nine.


LONE STAR MUD BRICK MACHINE
MANUFACTURED BY THE LONE STAR BRICK MACHINE WORKS. ST. LOUIS, MO.
PAT'D MARCH 1889.
AM. ENG. CO.

We call your undivided attention to this most excellent Soft Mud Brick Machine. It is of the strongest character and superior to the best in the market in every particular. As we have made arrangements for the manufacturing and putting up of 100 of these machines that we expect to sell this season, we are in position to offer you the most liberal bargains. *Send your order at once and don't delay.*

Capacity:

Steam Power Machine,	30-40,000,	Price $350.00
Horse-Power "	15-20,000,	" 250.00

Our Terms:

One-third cash must in all cases accompany the order to receive recognition or prompt attention.

☛For further particulars and circulars address

Lone Star Brick Machine Mfg. Co.,

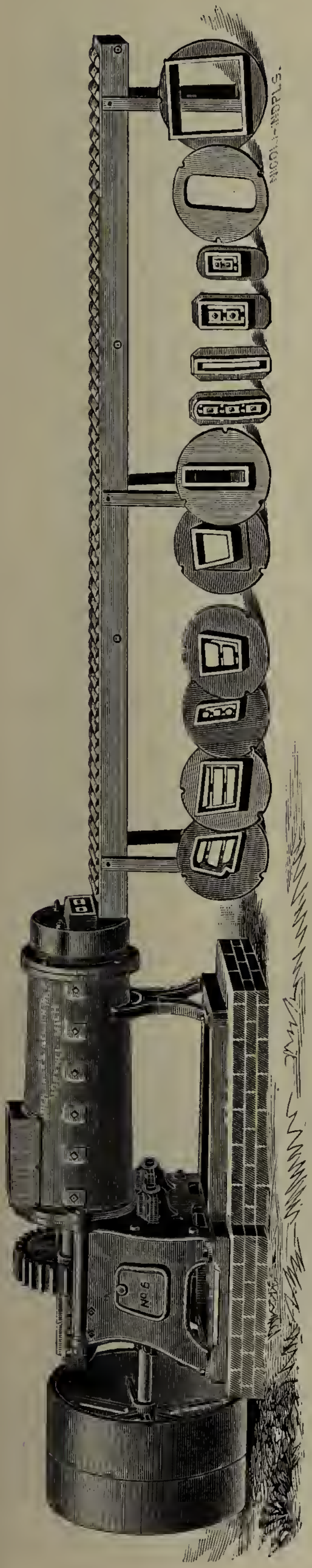
AUSTIN, TEXAS.

Mention the Clay-Worker.]

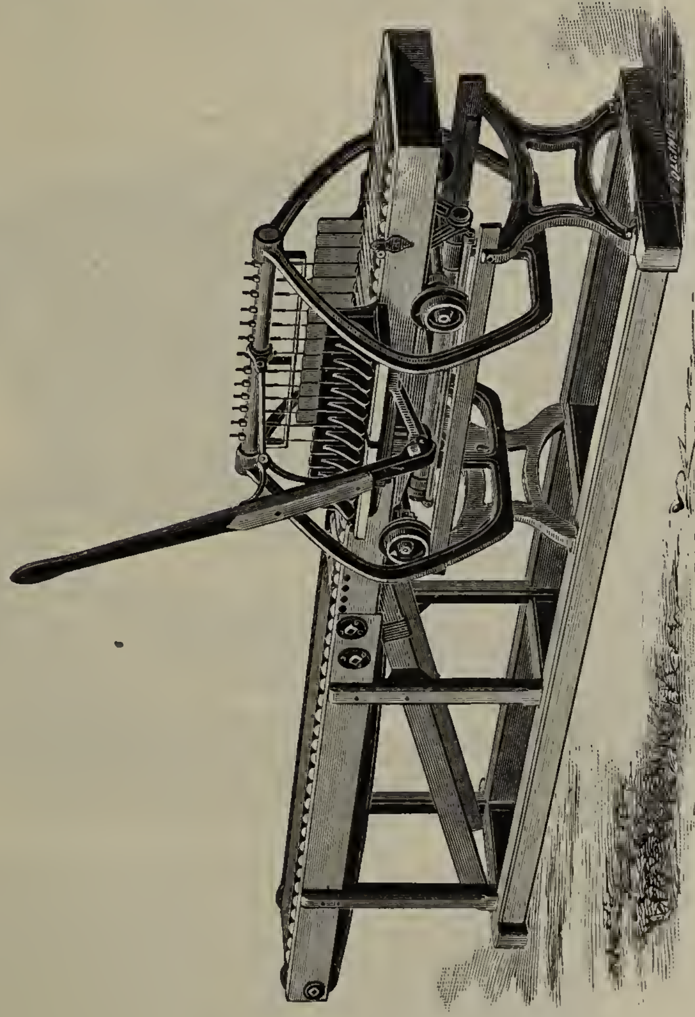
MICHIGAN BRICK AND TILE MACHINE WORKS,

—MANUFACTURERS OF—

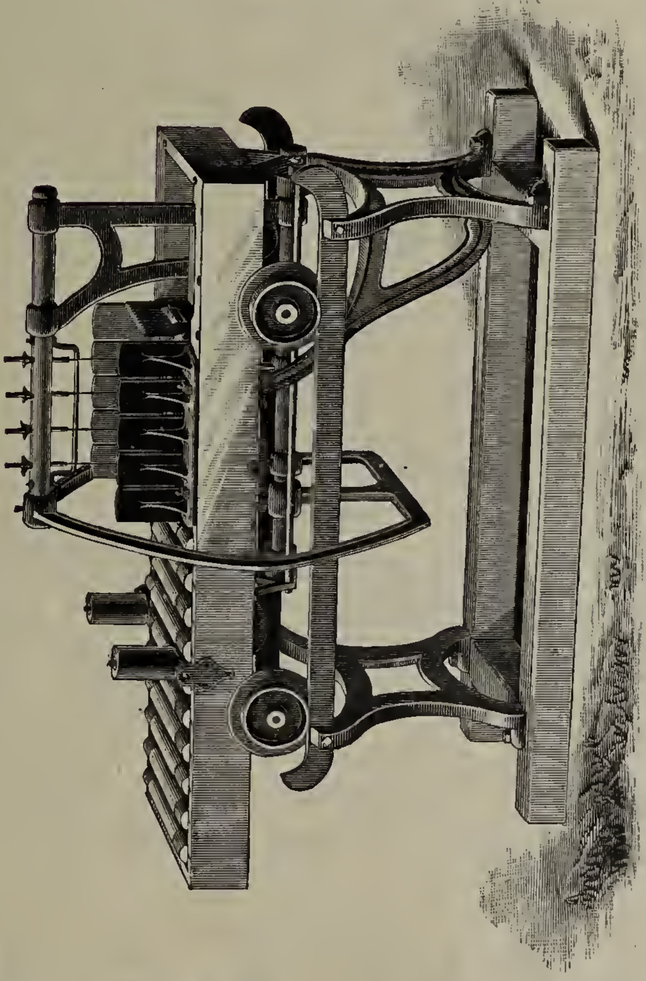
Brick and Tile Machinery.



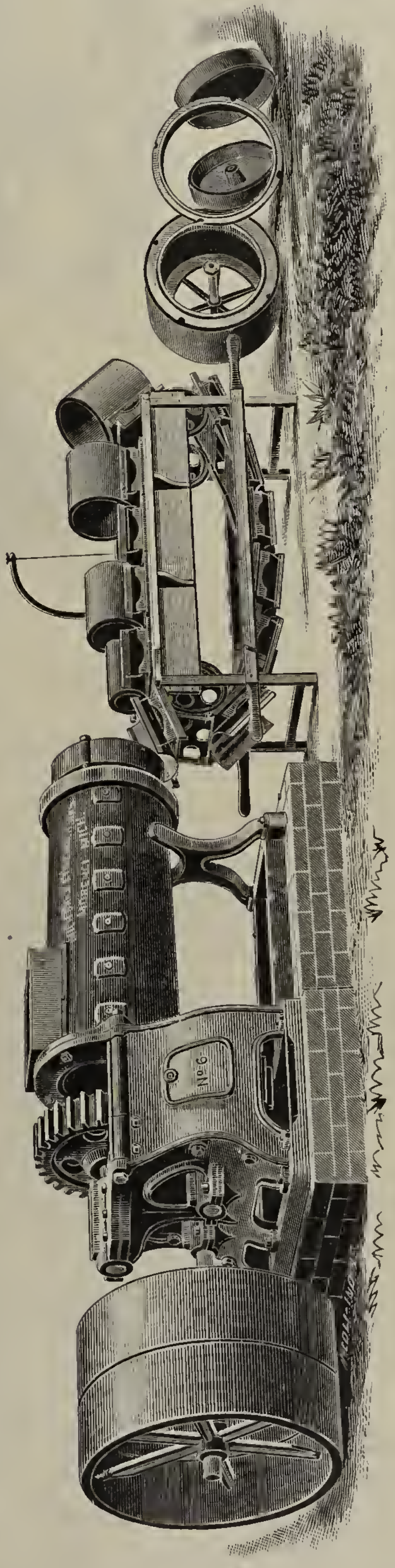
No. 6 Terra Cotta Lumber Machine.



Special No. 6 Curved Side Cut.



No. 1 Curved Side Cut.



No. 6 Special Brick and Tile Machine.

☞Send for Descriptive Circular.

MICHIGAN BRICK AND TILE MACHINE WORKS,

Lenawee County, [Mention the Clay-Worker]. MORENCI, MICH., U. S. A.

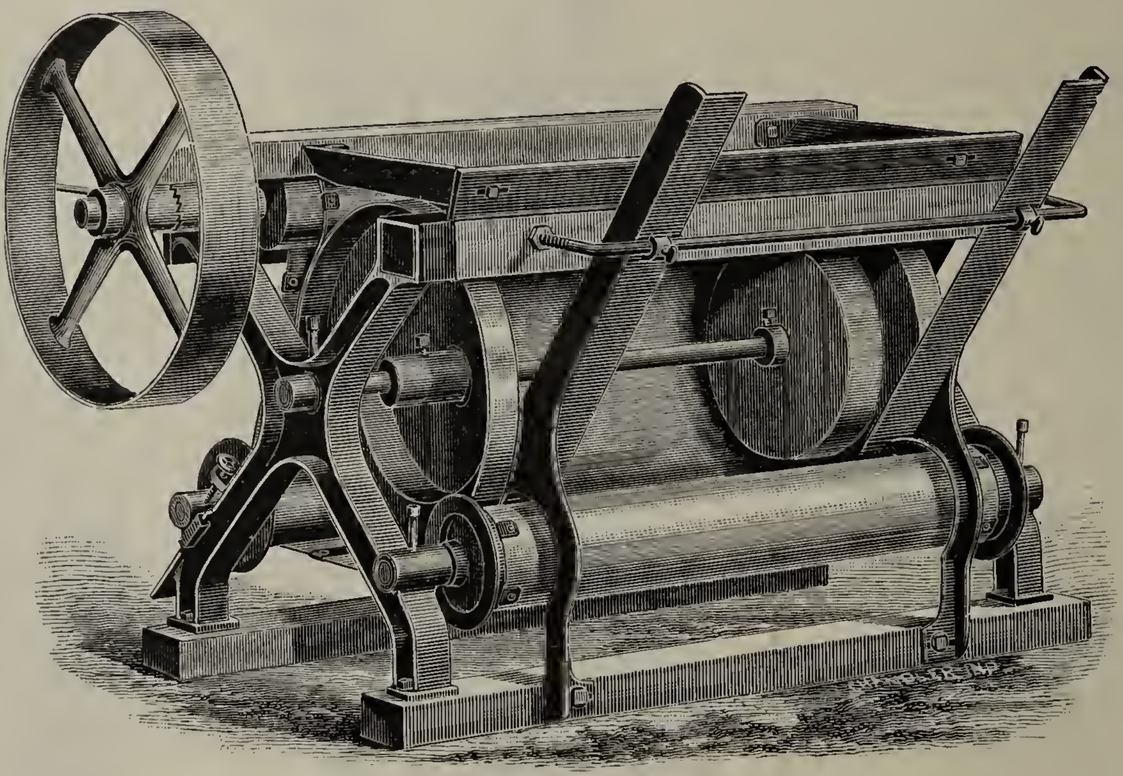
BRICKMAKERS, READ!

What a Few of The Users of Our Sander Say:

C. & A. Potts & Co:

GENTS:—As to your Mould Sander, we can only say that we could not ask for a machine that is nearer perfection both as regards simplicity and efficiency. It does not and cannot leak. The moulds do not and cannot clog or catch, and we are satisfied with it in every way. You are at liberty to use this in any way you may see fit and we shall be pleased to answer any inquiries, or show the machine at any time to any one you may send here. We are yours truly,

BERLIN BRICK CO.



W. H. Cater, Brick Manufacturer.

Appleton, Wis., May 25th, 1889.

C. & A. Potts & Co.:

GENTS:—I have set your Sander and given it a fair trial. It is just what I want and is just what you claim for it, and has given perfect satisfaction. Yours truly,

W. H. CARTER.

No Brickmaker using Brick Machinery can afford to be without this machine. It sands the moulds more perfectly than can be done by hand, every mould being sanded the same. It does not Waste or Spill the sand. The moulds cannot catch and cause delays. It never strikes for more wages, but is always ready for work.

All machines are guaranteed to do all claimed and will be shipped subject to approval.

Prices lower than any. Write for illustrated circular.

We also manufacture a full line of Brick Yard Supplies.

C. & A. POTTS & CO.

☞**NOTICE:**—A. H. Newton, of Cohoes, N. Y., claim our machine is an infringement on patent owned by them, and that persons using our machine will be prosecuted. As to this we would say that we do not infringe said patents; that we have put our machines on the market only after a careful investigation, to ascertain exactly what our rights are in the premises, and, being fully satisfied of our rights, we are prepared to protect our customers and Patents No. 397,274 of Feb. 5, 1889.

C. & A. POTTS & CO.,

INDIANAPOLIS, INDIANA.

[Mention the Clay-Worker.]

Of Interest To Every Brickmaker Intending To Purchase Disintegrators.

A WARNING.

Jonathan Creager's Sons, of Cincinnati, Ohio, are now manufacturing a Clay Disintegrator which is an infringement on our Patents. We have brought suit against them in the United States Circuit Court for the Southern District of Ohio.

We presume that this will be accepted as a sufficient answer to their statements in May number of Clay-Worker that our former notice was meant for bluff only.

We intend fully to protect our rights, and only waited until it was apparent that they were being wilfully infringed to bring suit.

Our Patents are numbers 322,393, *dated July* 14*th*, 1885, 368,898 *dated August* 28*rd*, 1887, *and* 384,278 *dated June* 12*th*, 1888.

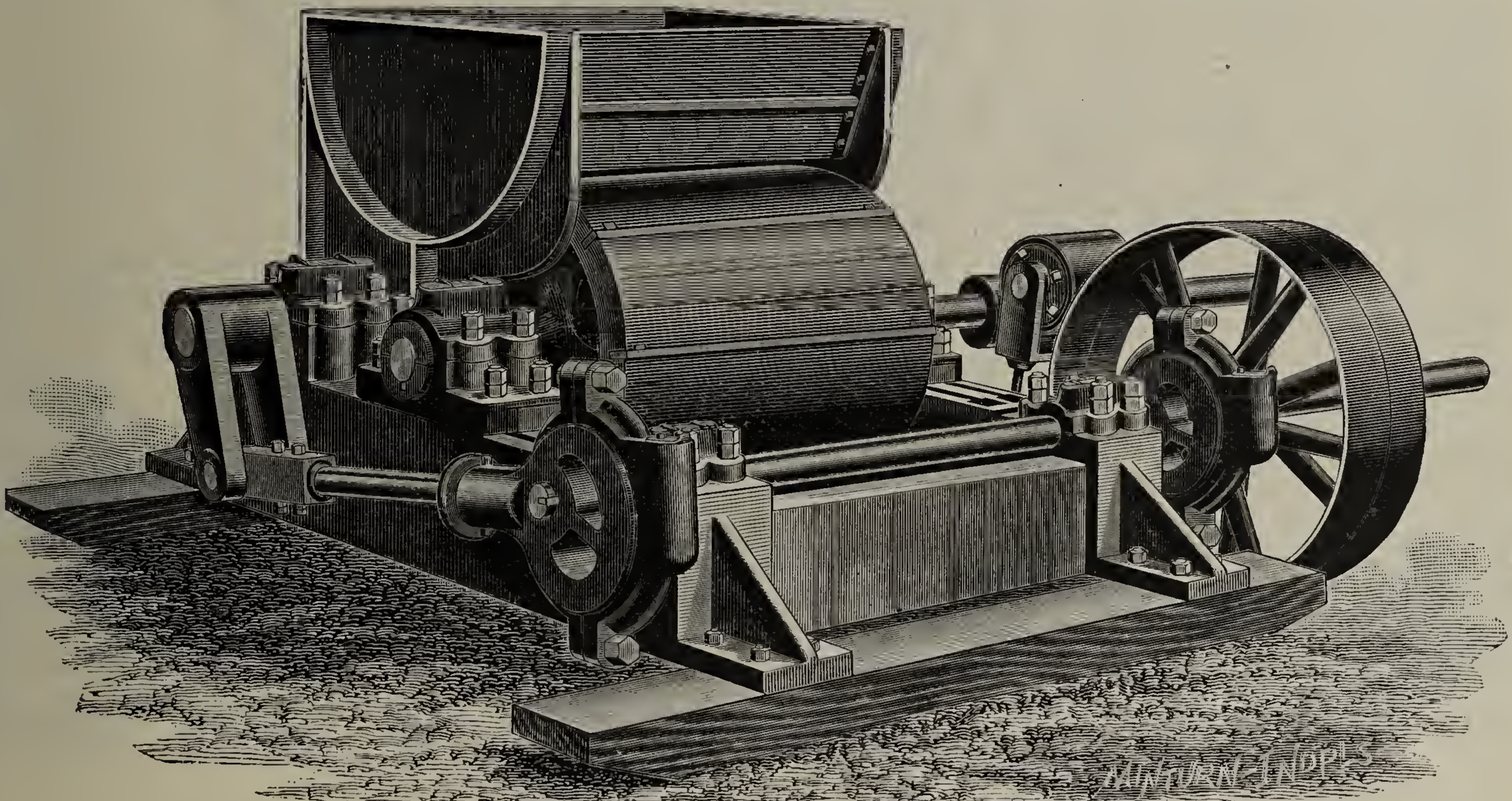
Always Buy The Best

AND ONLY

Clay Disintegrator On The Market.

The only machine that will work any clay direct from the bank, either wet or dry, thoroughly pulverizing all lumps, clods, and stone. It will not clog or choke It requires no extra man to punch the clods into it. The rolls do not wear or break as roller crushers do, necessitating a new set of rolls every two or three months.

THROW OUT YOUR OLD ROLLS AND



PUT IN A POTTS' DISINTEGRATOR.

It Will Save Its Cost In A Short Time.

The above cut represents our No. 4 Disintegrator. It will pulverize clay for 60,000 to 100,000 brick per day. Disintegrators of any capacity desired furnished on short notice.

C. & A. POTTS & CO.,

INDIANAPOLIS, - - INDIANA.

A. POTTS & CO.,

INDIANAPOLIS, INDIANA.

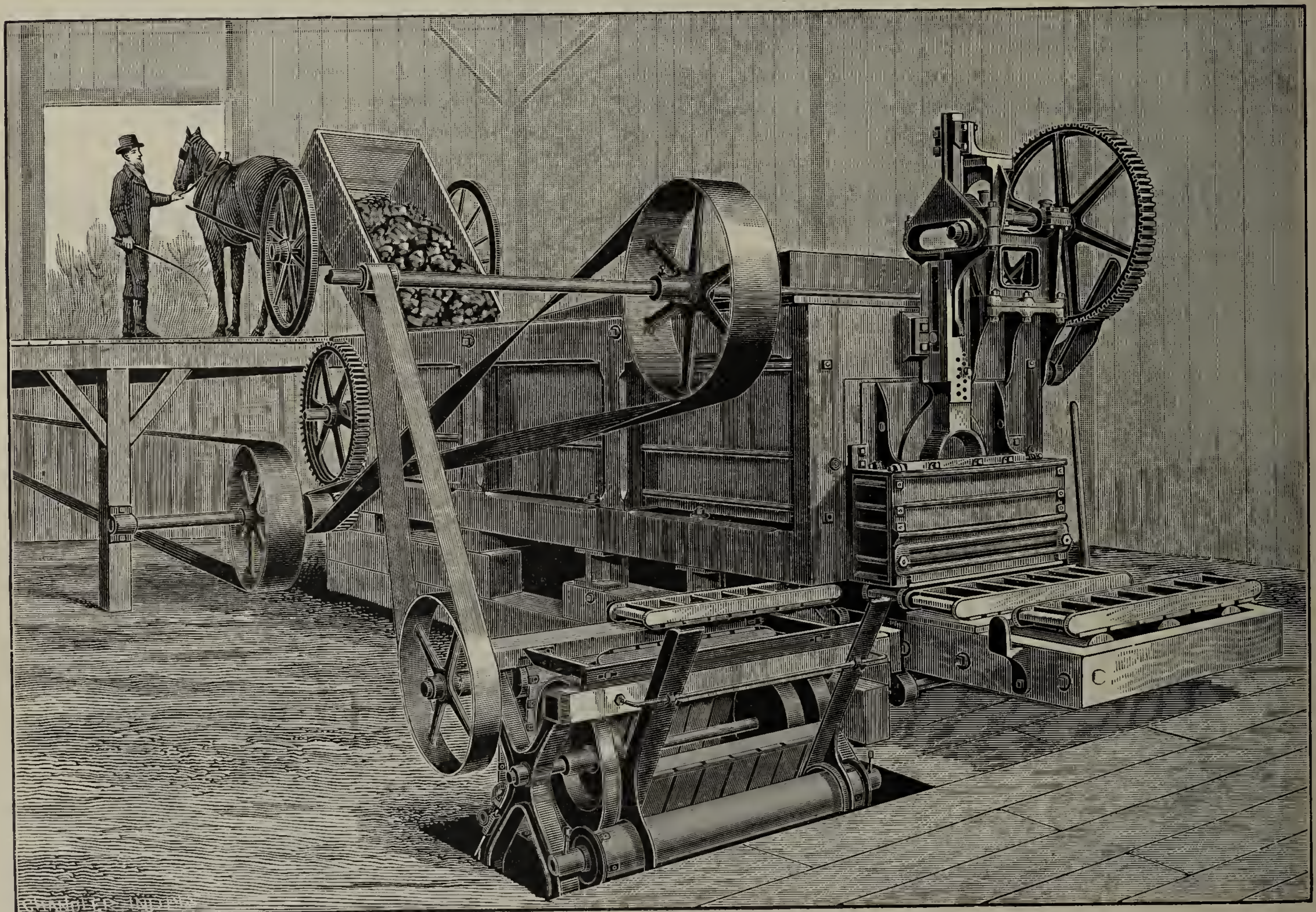
—MANUFACTURERS OF—

BRICK MAKING AND CLAY WORKING MACHINERY,

Including

Sand Mould Brick Machines, Pug Mills for Soft and Stiff Clay,
Mould Sanders, Disintegrators, Elevators, Kiln Castings and Yard Supplies

We are prepared to erect complete plants of any desired capacity.



OUR HORIZONTAL STOCK BRICK MACHINE AND MOULD SANDER

Is the best machine on the market for making sand moulded brick.
It is strong and powerful and will work the clay stiff enough to make the finest stock brick.
It works the clay direct from the bank not requiring extra Pug Mills as all vertical machines do.
It has no equal for Strength, Durability, Quantity and Quality of brick made.
It has no light complicated parts underneath machine, all parts being out where they can be kept clean.
Don't fail to write if in need of machinery in our line. Our prices are the lowest.
We shall be pleased to mail our complete descriptive circular.

ADDRESS

A. POTTS & CO., - - Indianapolis, Indiana.

AGAIN WE COME TO THE FRONT.

The Improved Grand Automatic,

ALL IRON AND STEEL.

This honorable machine as always the best will soon eclipse its own record. A machine which will at once be beyond all comparison, will answer all the requirements of the most skeptical, and must of necessity be adopted by your yard sooner or later and the sooner the better. We will in the near future place upon the market our Improved Grand Automatic Brick Machines and Horizontal Pug Mills, regular and extra heavy, made entirely of Iron and Steel, at once powerful, compact and symmetrical. We are then enabled to supply those manufacturers who desired to secure our excellent mechanical devices and automatic action but who held off because our machines had wooden parts. However, we shall still continue to build the wood frame machines—do not make a mistake on this point. We will now offer such a combination of Brick-making Machinery as has never been offered heretofore in the history of the world.

Complete plants for the manufacture of Building Brick,
For the manufacture of Fire Brick,
For the manufacture of Street Paving Blocks,
For Square Tiles, Shape Brick and Gutter Blocks

Atlas Automatic Cut-off Engine Outfits; Brick Machines, all Iron and Steel; Creager Horizontal Pug Mills, all Iron and Steel; Nos. 1 and 2 Clay Disintegrators, all Iron and Steel; Windlass Friction Hoist attached to Brick Machine countershaft; Clay Cars; Clay Conveyors; Mule Trucks; Brick Moulds; Repressing Machines; Brick Mould Sanding Machines.

We erect plants subject to trial and approval. Do not be deceived but investigate and ascertain just what we have been and are now doing in this particular service. Send for catalogue and write us plainly just what you wish to know.

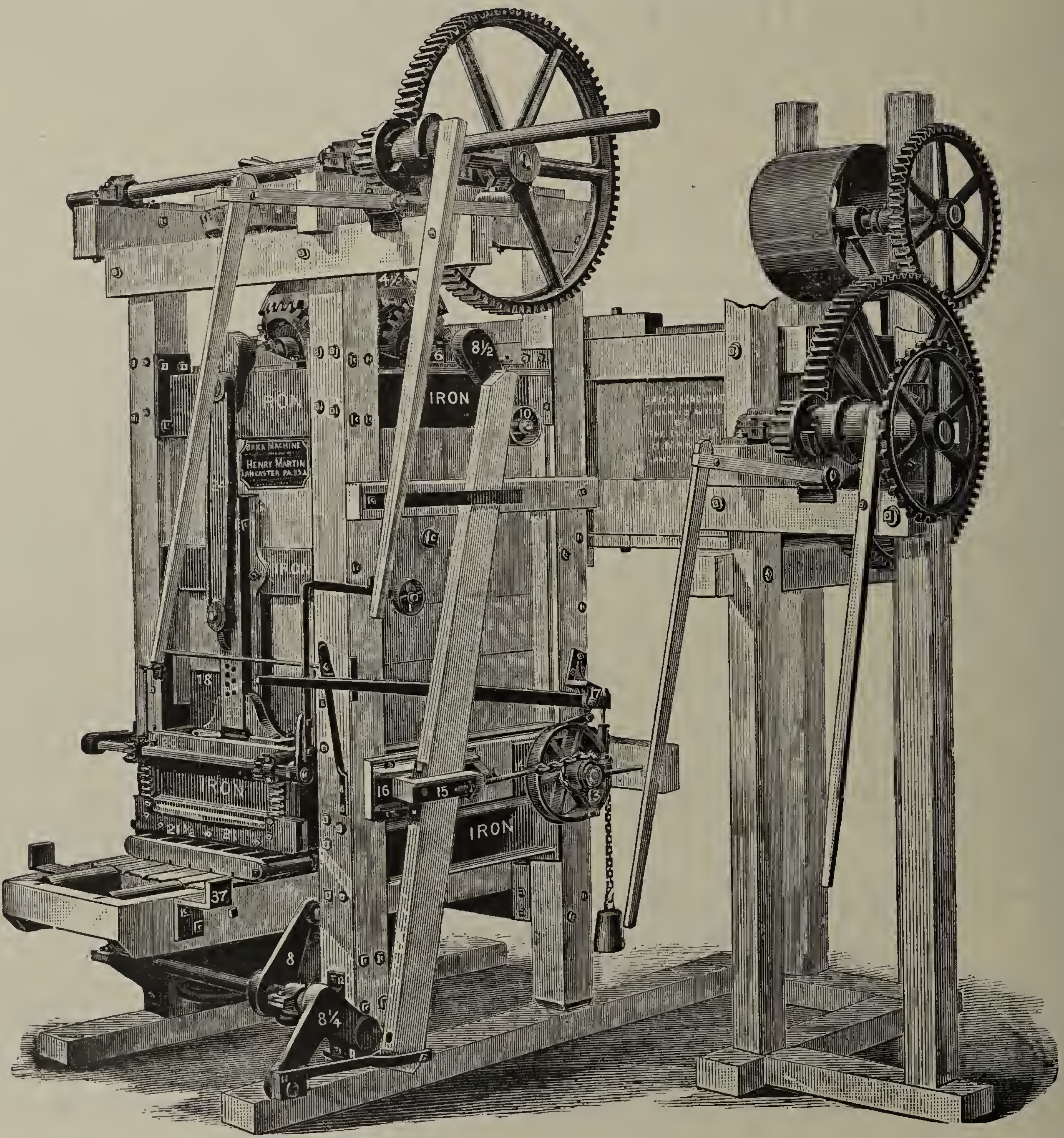
Wait for Cut for the all Iron and Steel Grand Automatic.

JONATHAN CREAGERS' SONS,
Cincinnati, Ohio.

The Henry Martin Brick Machine.

For Steam or Horse-Power.

FOR STEAM OR HORSE-POWER.



FOR STEAM OR HORSE-POWER.

This cut represents our Steam-Power Machine and Pug Mill combined. It is the strongest. It is the best. It is the most simple. It is the most perfect. It does the best work. It works any clay. It does not get out of order. It is not liable to break down. It stands hard usage. It can be changed to Steam Power.

BETTER THAN EVER.

Our machines are this season the Best ever built by our Mr. Henry Martin, whose thirty years' experience as rendered him familiar with the wants of the Trade.

For Strength, Durability, Qoantity of Output and Quality of Work, they have no equal.

Brickmakers make no mistake when they buy the Henry Martin Machine.

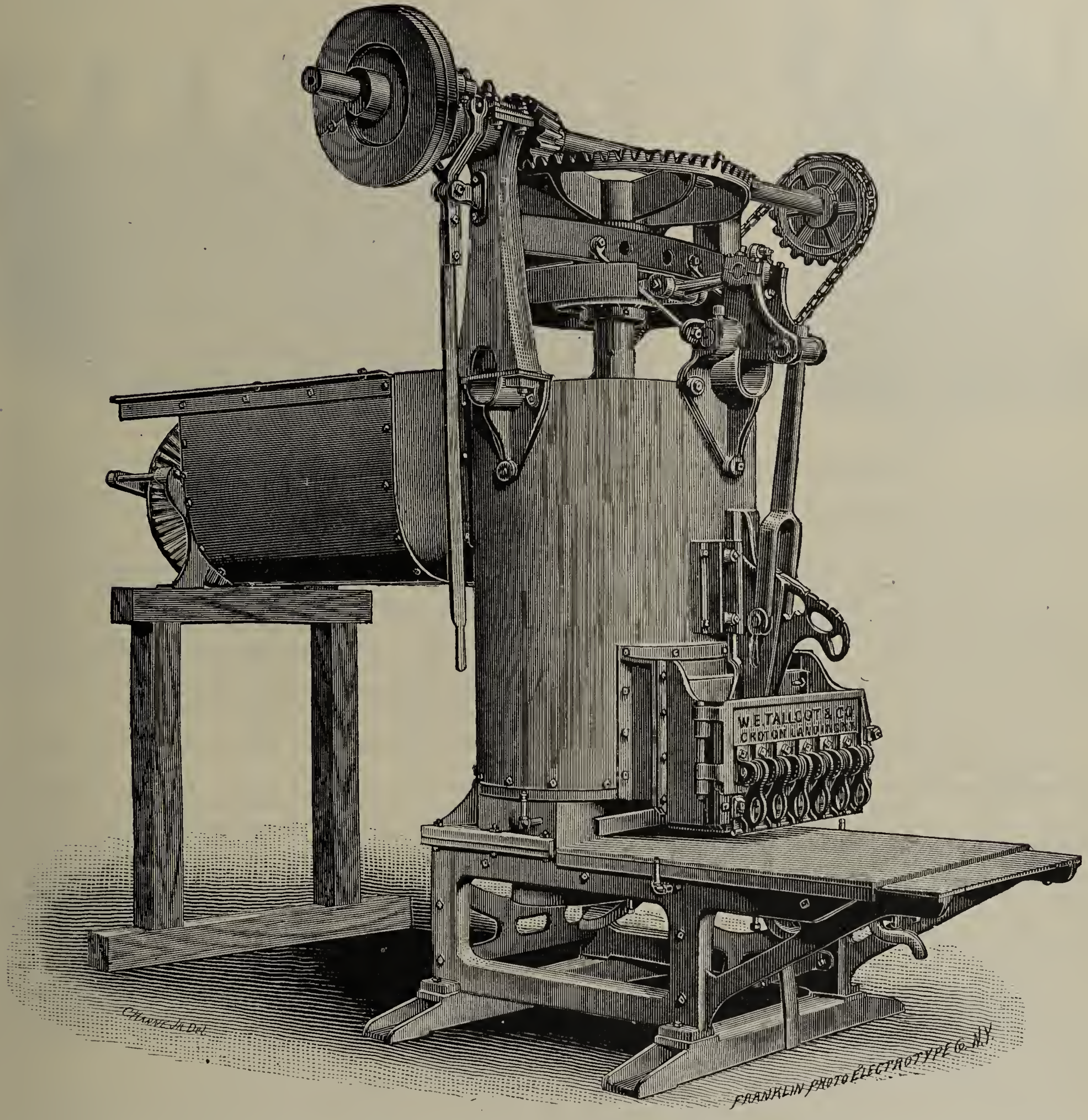
—MANUFACTURED BY—

The Henry Martin Brick Machine Mfg. Co.,

Send for a Catalogue.

LANCASTER, PA., U. S. A.

W. E. TALLCOT & CO'S.
I. X. L. Brick Machine and Improved Pug Mill.


W.E.TALLCOT & CO
CROTON LANDING N.Y.
C.HANNE Jr. Del.
FRANKLIN PHOTO ELECTROTYPE Co. N.Y.

This is a simple and powerful machine, making a superior brick and possessing advantages over all others. It is the result of years of experience in using and manufacturing brick machines. Among its advantages are *Great Strength, Simplicity and Durability* few parts, well protected from sand, yet easy of access for adjustment, renewal and repair. No wood is used in its construction; it is made all of iron and steel. Perfect automatic action to prevent breakage by stones or other obstructions. Great tempering capacity and ability to mould very stiff clay. It is easily understood, easily operated, easily kept in order. Quality of brick made, unsurpassed

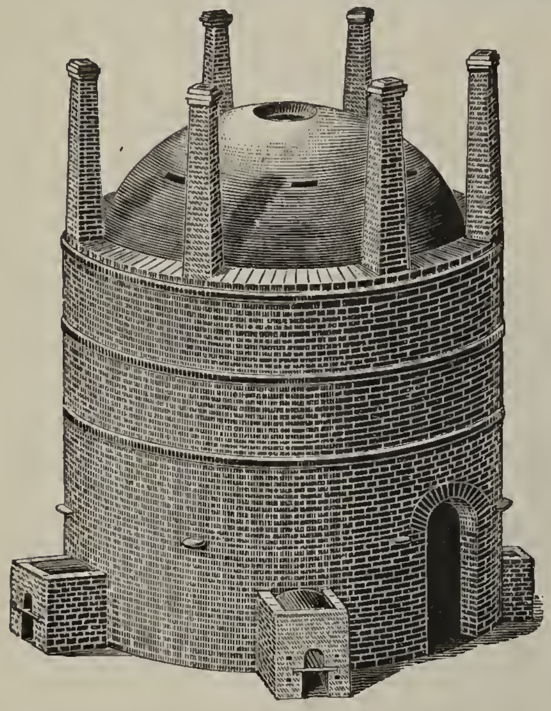
The I. X. L. is eipecially designed and built for heavy work. Weight of Machine and Pug Mill 10,000 pounds. Weight of Machine without Pug Mill, 7500 pounds. Send for circular and prices.

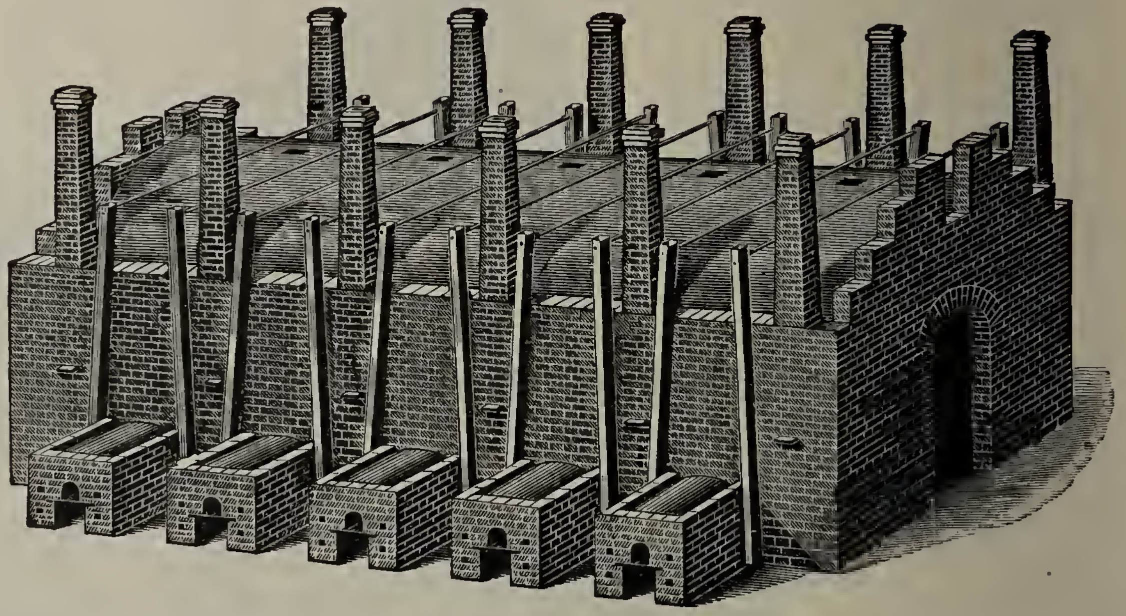
It will pay you to use the I. X. L.

W. E. TALLCOT & CO.,
Croton Landing. New York

THE EUDALY KILN.

BURNS ANY KIND OF CLAY OR WARE.





THE DOWN-DRAFT KILN.

UNIFORMITY IN BURNING is without a doubt the most essential feature to clay workers. Especially is this the case with fine clays where it is desired to have the wares of uniform color, size and hardness.

In the construction of these kilns particular attention has been paid to this point, by having first carefully examined the subject of drafts and the strength and nature of the different kinds of fuel. The size of the kiln, the size and number of furnaces, flues and chimneys must always sustain the proper relation to each other for a perfect draft. Too much draft is as dangerous as too little. One of the greatest mistakes of kiln inventors and builders is that they utterly disregard the important subject of drafts.

ABILITY TO DIRECT THE HEAT TO ANY PART OF THE KILN is equally as important as a proper draft. Unless the burner has control of the heat in the kiln he has no assurance of a uniform burn. In these kilns if the burner finds the wares too hot in any portion of the kiln he can in a moment shift the heat to any other part where it is not so hot, or what is better, if he has two or more kinds of wares in the kiln, one of which requires more burning than another, he can easily give that portion of the kiln an extra amount of heat. We claim that this is the only kiln in which these results can be attained successfully.

For this reason wares can be burned by this system **more uniformly** than by any other.

Practically there is no difference from top to bottom, yet this is purely a *down draft* kiln. There are no inside dampers or cut-offs. **Everything about the kiln is permanently built.**

ECONOMY OF FUEL AND LABOR is perhaps the second most important feature of any kiln. We hear a great deal sald about "economy in fuel and labor," but to understand what is necessary to a fuel and labor saving kiln one should be thoroughly acquainted with all kinds of fuel and the conditions necessary to get the greatest number of heat units out of it, and at the same time **distribute the heat to the burning wares in the most effective manner.**

We claim that our latest improved furnace is the most **complete economizer** of fuel that has ever been invented.

The construction is purely scientific, and is made by first obtaining the chemical requisites necessary to insure perfect combustion and then building a furnace to bring about these results. Different kinds of fuel require a different size and construction of furnace. We use any kind of fuel, soft coal, screenings, oil, gas or wood.

COST OF CONSTRUCTION—These kilns require no large stack, which ordinarily costs as much as the kiln proper. Many persons think they must have a large, tall stack in order to have sufficient draft to get the bottom of the kiln burned.

This is certainly a mistaken notion.

The things that are required, however, are a correct location and size of furnaces, flues and chimneys with reference to each other and the kiln. When these are properly attained the burner need have no fear about draft.

In these kilns great care has been taken to adjust these relations in such a way that the expensive stack is not at all required, and a much better draft obtained.

DURABILITY.—Each part of these kilns is built with special reference to strength and durability.

The furnaces, which are perhaps the most perishable parts of any kiln, are in these kilns made very strong and durable.

Those parts most liable to burn out can be easily removed and replaced without damage to the other parts of the furnace.

Rules are given by which a builder of these kilns can get the strongest crown and best supports to the kiln.

SIZES.—These kilns can be built either **round** or **square,** and of **any** desired **size.** A number of these kilns are now in use that burn from **150** to **250** thousand bricks at a time. The walls are built **twenty-four inches thick.** They should be lined throughout with fire-brick where the clay is very hard to burn. Good kilns can be made, however, without using fire-brick for any part except the **furnaces** and **bags.** In asking for cost of construction **state size of kiln in feet wanted,** whether the kiln walls, crown or bottom are any or all to be lined with fire-brick.

DRAWINGS and specifications for building kilns will be furnished any who purchase *kiln or yard rights.* We usually can furnish a man to superintend the building if desired.

For further information address

W. A. EUDALY,

64 Johnston's Building, - - - - CINCINNATI, OHIO.

MORRISON'S
IMPROVED KILN

FOR -:- BURNING -:- CLAY -:- WARES

Especially adapted to Burning Common, Repressed and Ornamental Brick.

PATENTED IN UNITED STATES AND CANADA.

SUCCESSFUL! DURABLE!

Daily product of our Kilns in the United States, One-Half Million Bricks. Our claims fully substantiated BY OUR PATRONS. We claim ninety to ninety-five per cent. hard brick. Arch bricks all Fronts and Pavers and none damaged—of uniform color. Pressed brick burned without fire-marks—coal screenings preferred for fuel. One fireman for two hundred thousand bricks. The

Only Kiln That Regulates the Temperature of Heat

And directs its course by a system of air drafts, giving complete control of the degree of heat, as well as its manipulation. This system we have covered by letters patent. Any persons using these air drafts are liable to prosecution for infringement.

Read the following testimonial from a recent patron, and another new one from an old patron:

Knoxville, Tenn., October 31st, 1888.

R. B. Morrison, & Co., Rome, Ga.:

Gentlemen—I have used your *Improved Kilns* during the past twelve months and cheerfully report the result. We burn our bricks in your Kiln at a cost of sixty-five cents per thousand for fuel and labor; a saving to us, over our old method, of eighty cents per thousand on the two items. My saving in waste brick in the kiln and at the building is fully *ten per cent.*, or sixty cents per thousand in other words Every time I burn your kiln of 300,000 bricks it is a saving to me of *more than four hundred dollars* over the old process. I find your kiln durable and simple to operate. We use coal screenings for fuel. Have no waste in arches, and burn ninety per cent. hard brick. I have no hesitation in pronouncing your kiln a success in every respect, as you make no claims it does not fulfill. Yours Truly,

REPS. JONES.

Atlanta, Ga., July 20th, 1888.

R. B. Morrison & Co., Rome, Ga.:

Gentlemen—We have used your Improved Kilns for three years and during that time have burned upward of a hundred millions in them and wish to emphasize our former statement in regard to your kilns. They are reliable, durable, and the best kilns for our purpose, we have been able to find after investigating many of the various kilns in use, and say to our friends of the trade: If you want kilns that will burn your brick nearly all hard, and do it every time, burn them economically and without loss, and with little cost for repairs, secure the Morrison Kiln.

CHATTAHOOCHEE BRICK CO., per Geo. W. Parrot, Vice-Pres.

—WE SELL OUR KILN STRICTLY ON MERIT—

☞For descriptive circulars, additional testimonials, and all information desired, address

R. B. MORRISON & CO.,

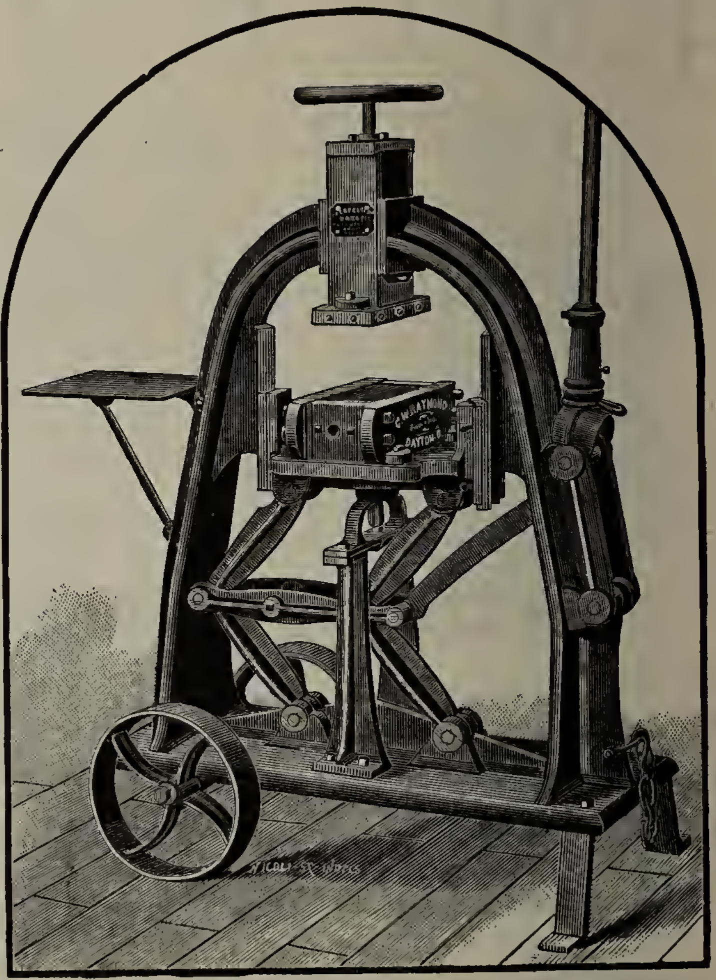
Box 335, - - - - ROME, GEORGIA.

RAYMOND'S
PERFECTION BRICK PRESS.

(NO. 1 FOR RED BRICK. NO. 2 FOR FIRE BRICK.)

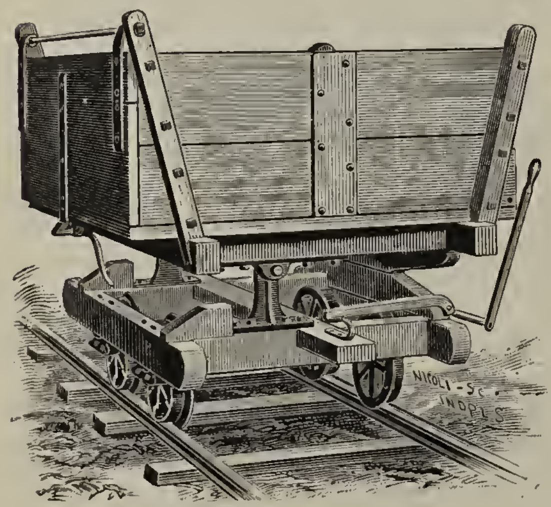
SIMPLE, POWERFUL.

Its whole action is derived from a short, easy, but powerful movement of one lever. A Perfect press which turns out perfect work.



—MANUFACTURERS OF—

AUTOMATIC DUMPING CARS,



For Brick Yards, Gravel Pits, Plantations, Mines, Etc.

SAVES TIME.

SAVES LABOR,

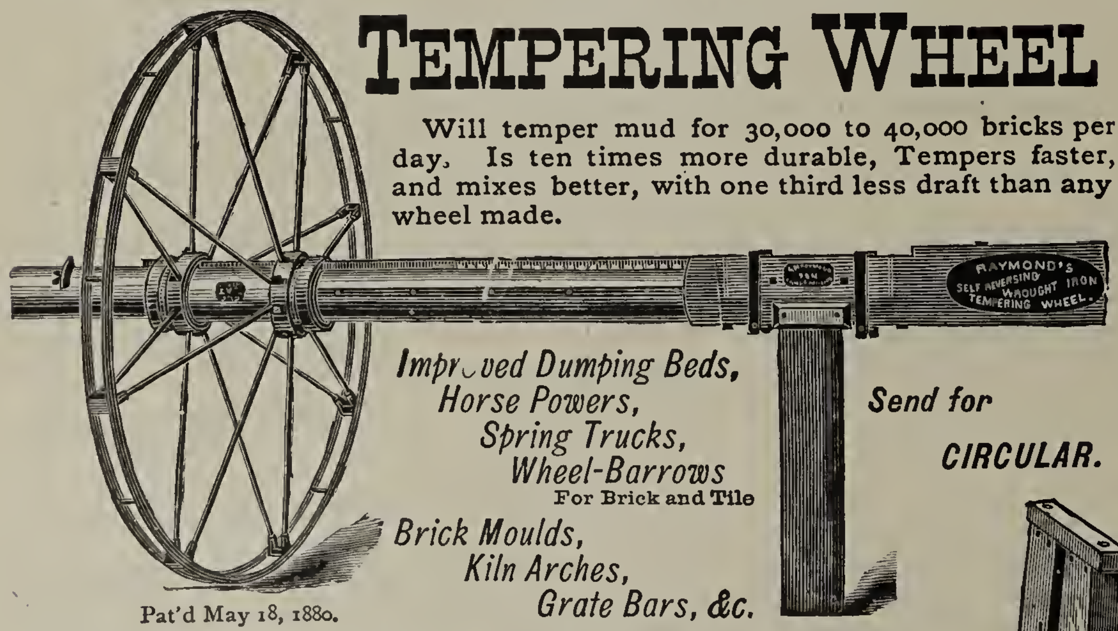
SAVES MONEY.

Write for Illustrated Catalogue giving full description.

RAYMOND'S **WROUGHT IRON**

TEMPERING WHEEL

Will temper mud for 30,000 to 40,000 bricks per day. Is ten times more durable, Tempers faster, and mixes better, with one third less draft than any wheel made.


RAYMOND'S SELF REVERSING WROUGHT IRON TEMPERING WHEEL.

Pat'd May 18, 1880.

Improved Dumping Beds,
Horse Powers,
Spring Trucks,
Wheel-Barrows
For Brick and Tile
Brick Moulds,
Kiln Arches,
Grate Bars, &c.

Send for CIRCULAR.

BRICK BARROWS.

Our Barrows are made from the best of seasoned white-oak, braced in front and cross braces underneath; iron wheel and axle and three coats of paint; the frame is morticed throughout. They will stand the rough usage of the brick yard. For strength and durability they have no equal.

BRICK MACHINE MOLDS.

We manufacture a great number and variety of molds and with improved machinery, we are able to fill orders with dispatch. Our molds are made of the best of cherry wood with side pieces gained for partitions and each partition is in turn dove-tailed into the sides. **They are thoroughly iron bound.** The cross-irons being dove-tailed. Without doubt, the most substantial mold made.

C. W. RAYMOND & CO.,

7 & 11 WAYNE STREET, (Mention Clay-Worker.) DAYTON, OHIO.

CHAMBERS BROTHERS CO.,

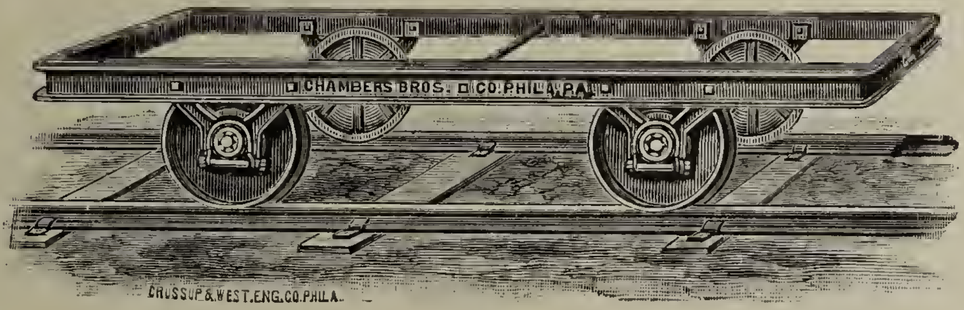
FIFTY-SECOND ST., BELOW LANCASTER AVE,

PHILADELPHIA, PA.

Improved Tunnel Dryers For Common Brick

And the Most Durable and Complete System for Transporting Green Brick.

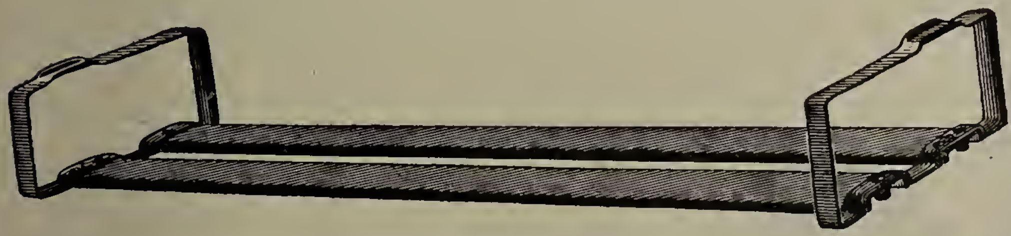
The Strongest Car Made.


CHAMBERS BROS. CO. PHILA. PA.
CRUSSUP & WEST. ENG. CO. PHILA.

The Strongest Car Made.

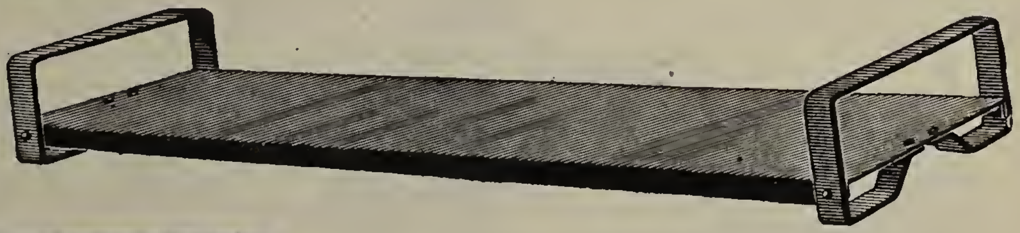
CHAMBERS' WROUGHT-BODY DRYER CAR.

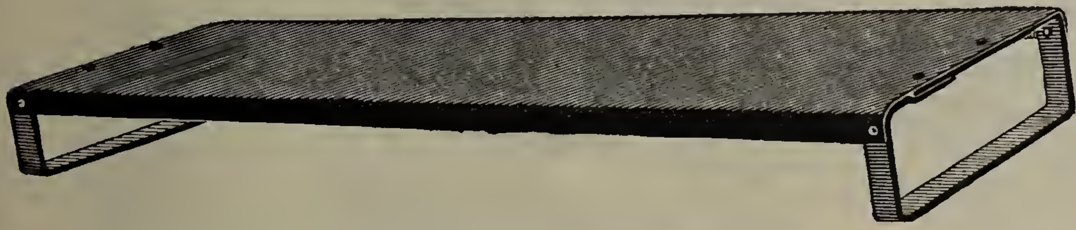
A lower priced Car with cast iron bodies made to order.



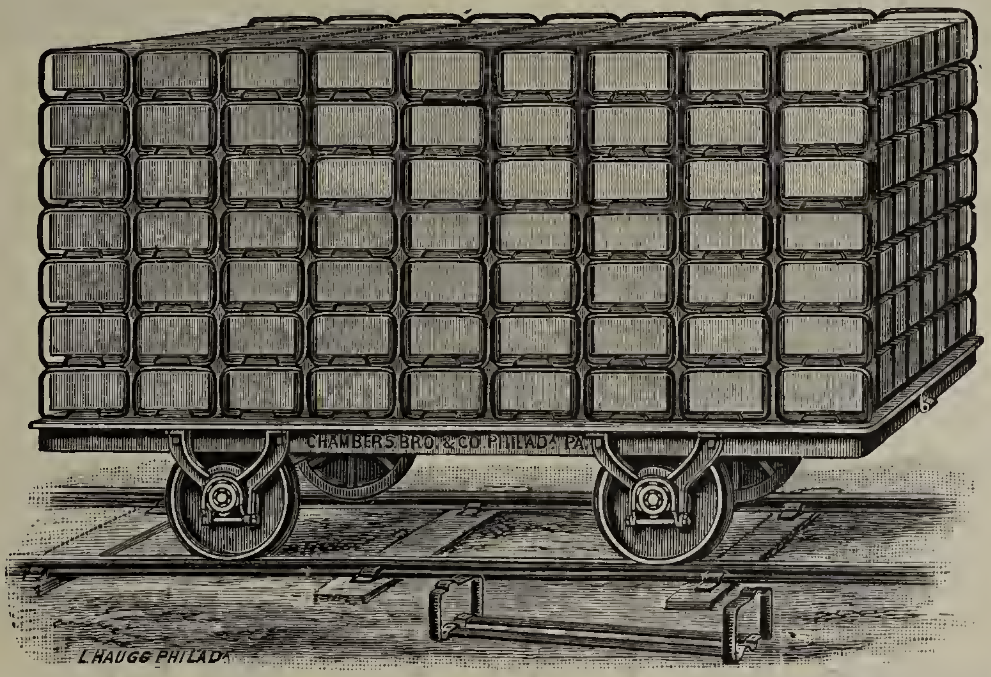
☞ Wrought Iron Interlocking Pallet for Stiff Tempered Brick only.

Steel Pallet for brick placed on flat side or on edge. ☞





☞ Steel Pallet for soft moulded brick, or those placed on flat side only.


CHAMBERS BRO. & CO. PHILADA. PA.
L. HAUGG PHILADA.

CHAMBERS BROTHERS COMPANY,

PHILADELPHIA, - - PA.

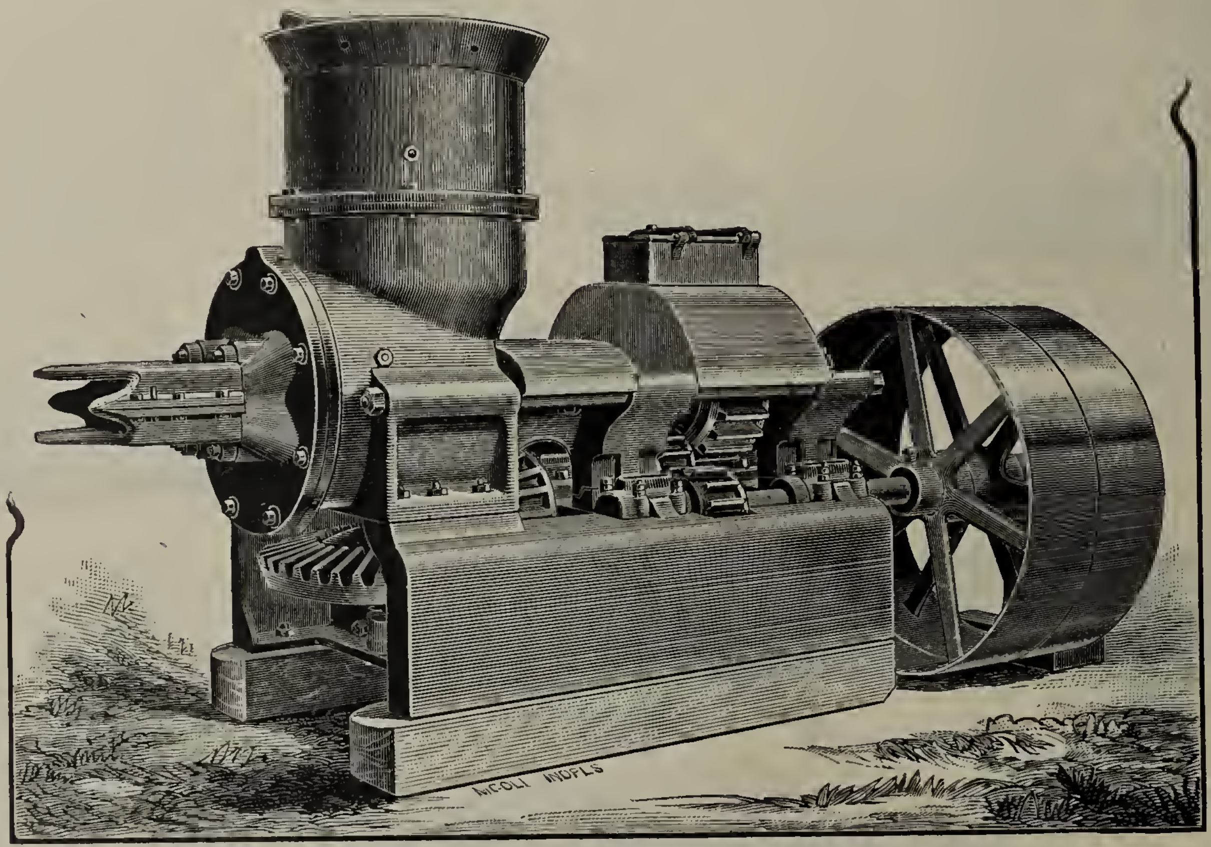
☞See ad. on front cover page.

[Mention the Clay-Worker.[

The Wallace Manufacturing Company,

FRANKFORT, INDIANA.

In the antique races we may have been beaten but Ben Hur is now holding the reins on a new team—the Little and Big Wonder which we are confident will roll up a good bank account for any one who will invest their money in them.



The above cut represents the Little Wonder in its new dress.

The Big Wonder with Automatic Table will appear in the near future.

For full particulars of the Big and Little Wonder, Automatic Table, Clay Crushers and Stone Separators, Pug Mills, Trucks, Iron Cars and other Clay Working Supplies, write to

THE WALLACE MFG. CO.,

FRANKFORT, IND., U. S. A.

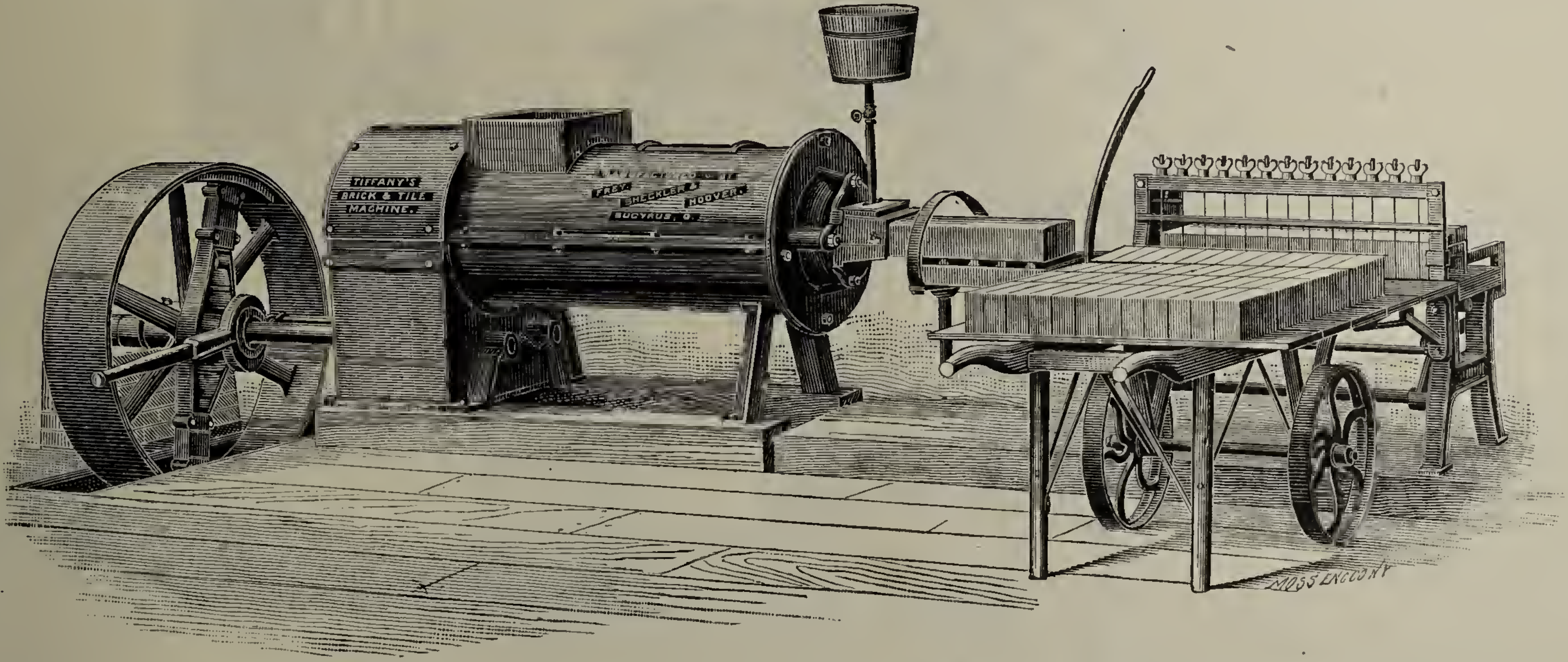
[Mention the Clay-Worker.]

THE FREY, SHECKLER CO.

BUCYRUS, OHIO

With increased facilities threefold.

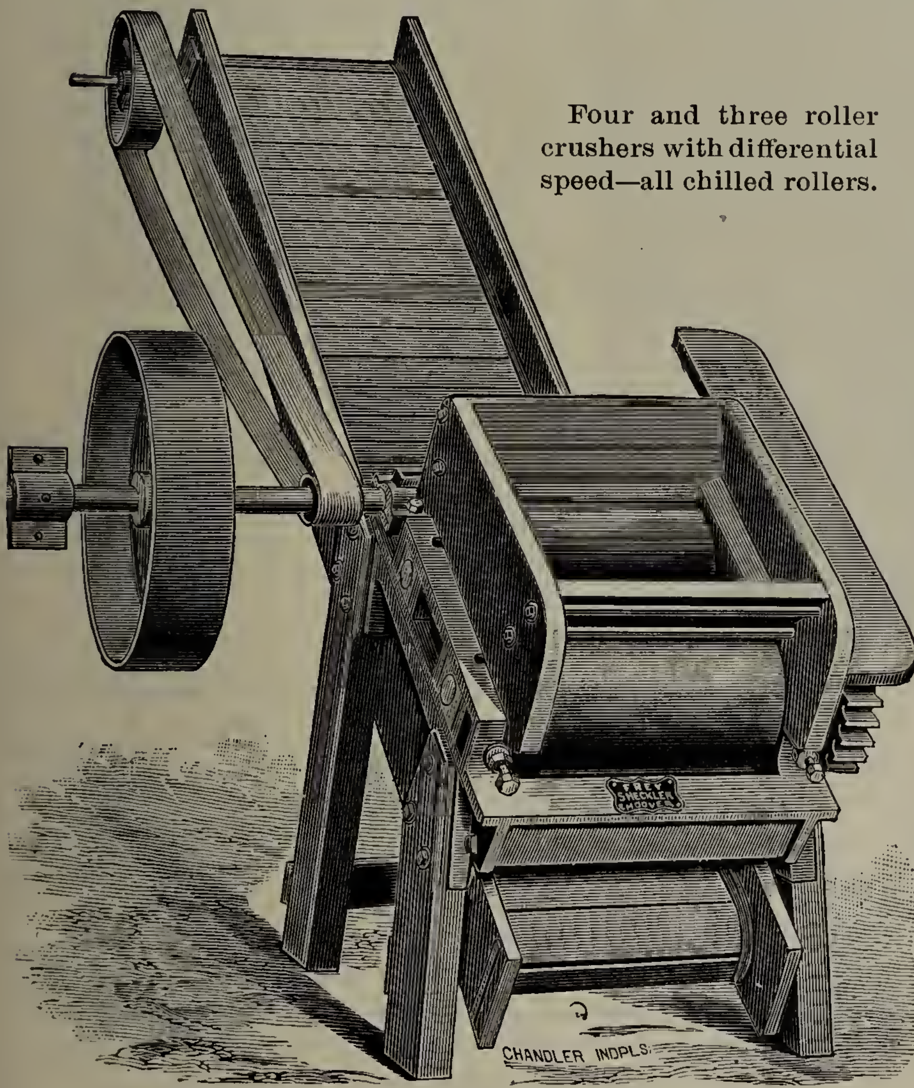
Seven different brick machines. Four different tile machines. Will make any quantity of brick or tile as desired.


TIFFANY'S BRICK & TILE MACHINE.
FREY, SHECKLER & HOOVER BUCYRUS, O.

The Mascot for light power and low in price.

CUT OF CENTENNIAL WITH SELF-LOADING ATTACHMENT ON CUTTING TABLE.

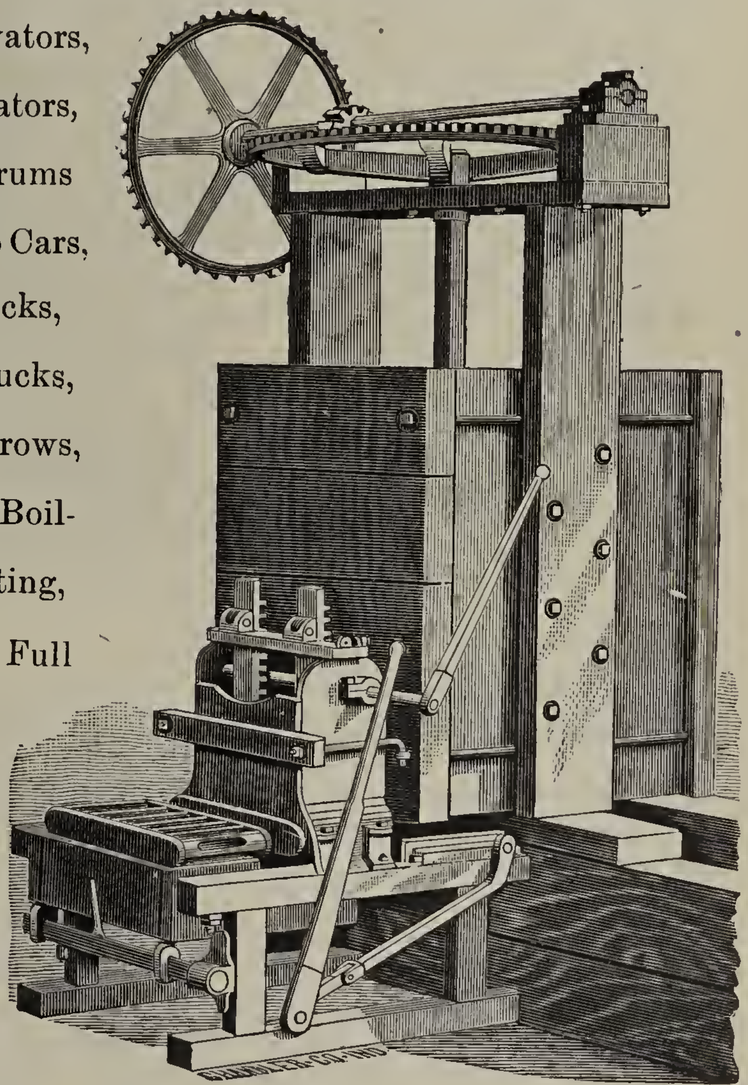
The above cut shows the Board Delivery Cutting Table which loads the brick automatically on special trucks in connection with the Centennial Tiffany Machine and Patent Lubricating Brick Die. Acme Special Brick Machine, largest capacity. The Duplex, 80,000 brick per day.



Four and three roller crushers with differential speed—all chilled rollers.

We make thirteen different patterns of Roller Clay Crushers. All rollers best chilled iron.

Clay Elevators, Tile Elevators, Steam Drums and Dump Cars, Tile Trucks, Brick Trucks, Wheelbarrows, Engines, Boilers, Shafting, Pulleys. Full outfits for Brick and Tile Factories and Fire Clay Works.



The Eagle Brick Machine.

Cheapest and Simplest for Horse and Steam power

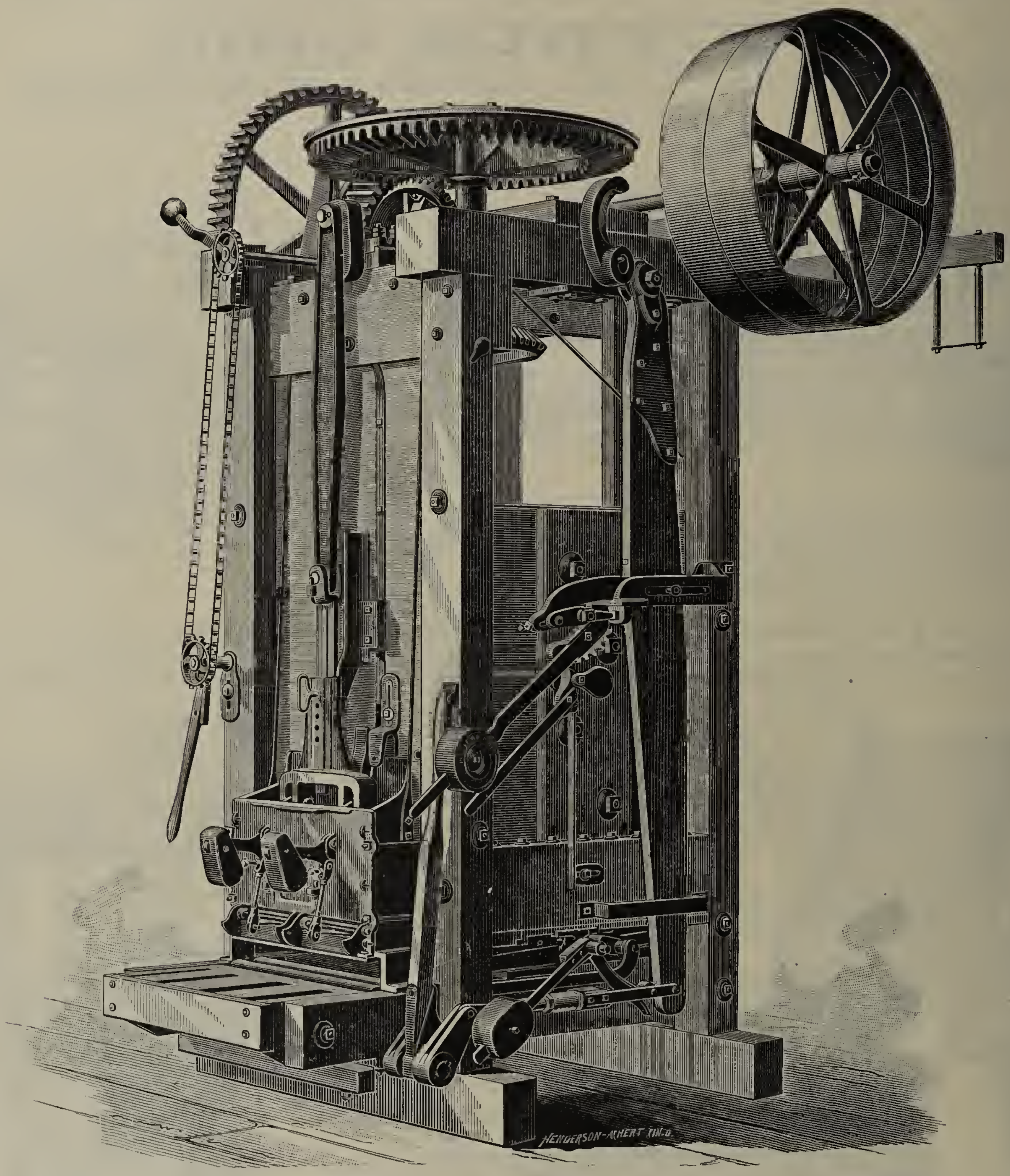
(16,000 brick per day.)

PLANS FOR KILNS FURNISHED CUSTOMERS.

Send for illustrated circulars to

The FREY, SHECKLER CO., Bucyrus, Ohio.

The "Tiffin" AUTOMATIC Brick Machine



The "Tiffin" **Automatic** Brick Machine is, **beyond question,** the best machine of its class in the market. It is **Heavy, Strong and Durable. IT IS GUARANTEED TO DO GOOD WORK.**

The **"TIFFIN"** is made for use by **Steam,** or **Horse** power. The capacity of the **Horse Power Machine** is 18,000 to 20,000 per day, and of the **Steam Power** 25,000 to 40,000 per day, according to the speed at which they are operated.

Both styles are equipped with our **Automatic "Stone Doors,"** which permits a stone, or any other hard substance, that may have passed in with the clay, to pass out **without breakage to the Machine.**

PRICES:		
	Steam Power Machine	$350.00
	Horse Power Machine	$250.00

The principal shafts are of Steel, and all other material used, is **First Class. Competent Workmen Only Employed** in their onstruction. These machines have been **Thoroughly Tested** in the hands of **Experienced Brickmakers** during the past season, and with the most **Satisfactory** results to them. Parties who may be **Interested Enough** to wish to make inquiry, will be given the names and address of the parties who have had them in use.

We are the makers of the **CELEBRATED "OLD RELIABLE"** Brick Machine, for use by hand power, which is so well and favorably known to the Brickmakers of the entire country. We are also manufacturers of Turn Tables, Trucks, Wheel Barrows, Molds, Kiln Doors, Etc., Etc. Correspondence solicited.

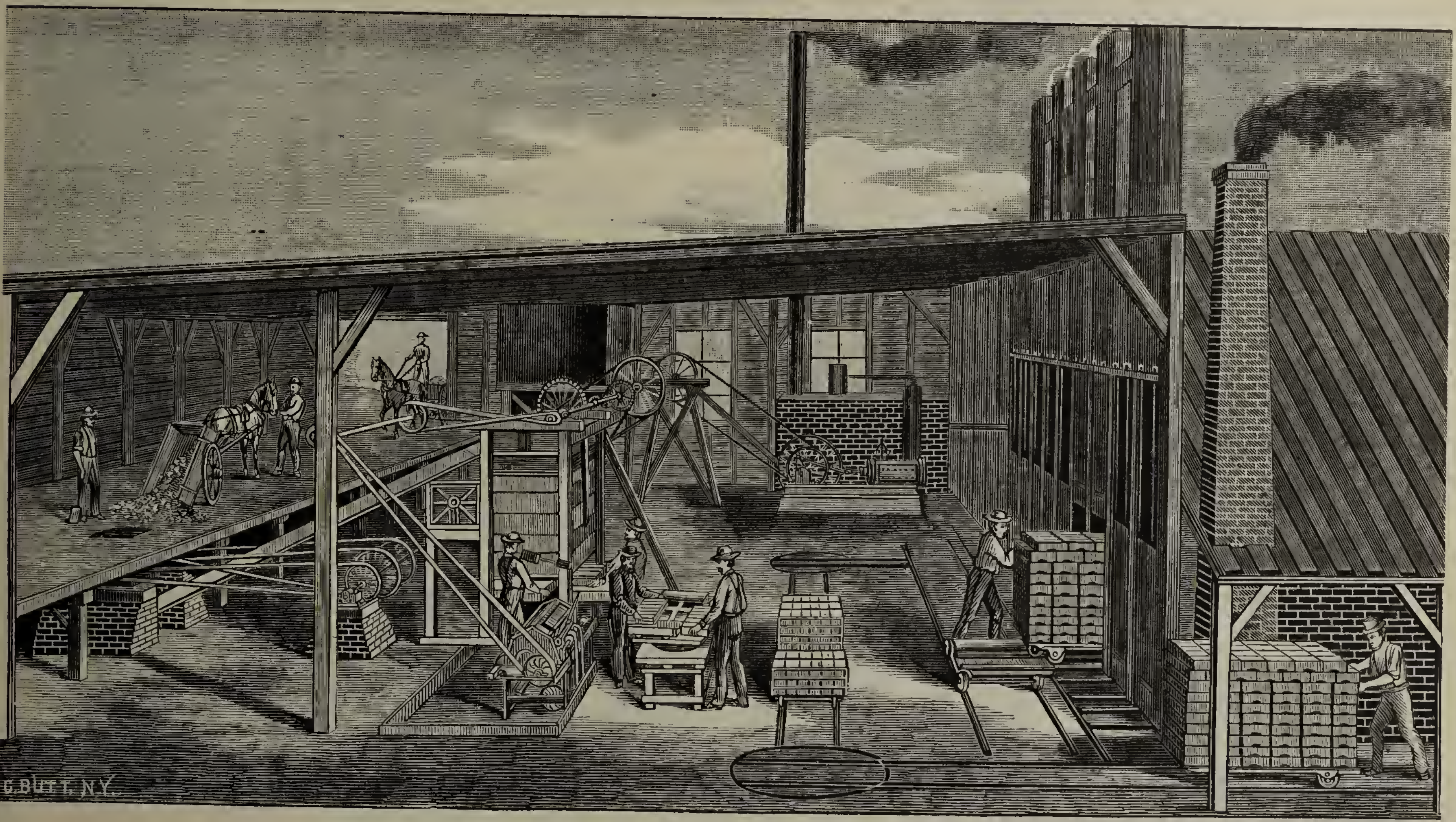
TIFFIN AGRICULTURAL WORKS,

[Mention the Clay-Worker.] **TIFFIN, OHIO.**

SHARER'S IMPROVED DRYER

☞ More than one hundred now in use DRYING SUCCESSFULLY Soft Mud Brick, Stiff Mud Brick, Pressed Brick, Fire Brick, Hollow Brick, Tile, Plaster, Architectural Terra Cotta, Terra Cotta Lumber, Peat and Lumber. ☜

No other Dryer in existence can successfully dry such a variety of Materials.



23 are now in process of Construction and under contract to be built this Spring.

The Only Successful Soft Mud Brick Dryer in Existence.

Will also dry Stiff Mud, Semi Dry and Pressed Bricks at 50 per cent. less cost than any Steam Drier.

No other Dryer will Guarantee to dry Soft Mud Brick. I Guarantee to dry any kind of Bricks.

It is not a Direct Heat Dryer, nor a Steam Heat Dryer. It is a Radiated Heat Dryer. The heat being produced from Coal, Wood, Coke, Oil, Gas or any kind of Fuel, and Radiated through Brick or Metal floor. The heat can be so graduated as to successfully dry the most Tender or Refractory Clays without damage. While in a Direct Heat Drier the product of combustion coming directly in contact with the material to be dried will warp, check and crack in most cases. In a Steam Drier the heat cannot be graduated. Neither can heat be produced from Steam near as cheaply as from the Fuel Direct. With a Steam Dryer it is necessary to run one or more Boilers and Exhaust Fans day and night. There is No Machinery whatever necessary to operate my Dryer. Hence the wear and tear and expense of operating is reduced to the minimum.

References and all information given by letter or otherwise. Address,

GEORGE W. SHARER, Proprietor,

134 South Ninth Street,

PHILADELPHIA, PA.

ED. H. CALLAWAY, Gen'l Agt., 72 Redde St., New York.
E. A. KING, Special Agt. New England States, 48 Congress St., Boston, Mass.
HUGH CAMERON, Toronto, Ont., Special Agt. Dominion of Canada.

St. Louis Iron and Machine Works, Iron Founders and Builders of Heavy Machinery.

ESTABLISHED 1854.
INCORPORATED 1875.

Office and Works: Main St. and Choteau Avenue,

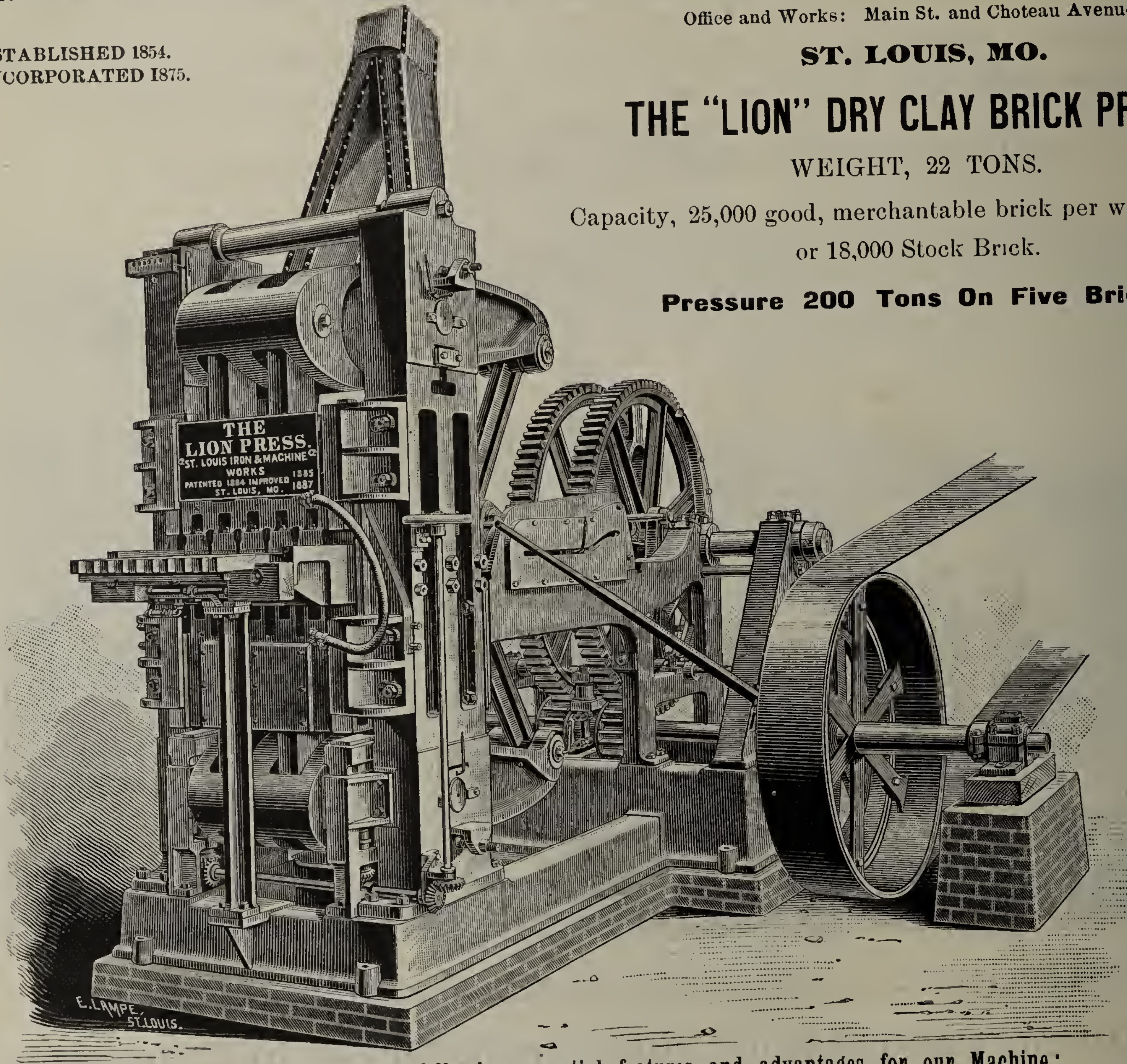
ST. LOUIS, MO.

THE "LION" DRY CLAY BRICK PRESS.

WEIGHT, 22 TONS.

Capacity, 25,000 good, merchantable brick per working day, or 18,000 Stock Brick.

Pressure 200 Tons On Five Bricks.


THE
LION PRESS.
2ST. LOUIS IRON & MACHINE Co
WORKS
PATENTED 1884 IMPROVED 1885 1887
ST. LOUIS, MO.
E. LAMPE, ST. LOUIS.

We claim the following essential features and advantages for our Machine:

1. The main feature of this machine is its great strength, power and durability. The pressure on each brick being 40 tons, and the working parts are so strongly constructed that there is no spring or give under this working strain. 2. The great simplicity and openness of framing and construction, so that every part of the machine is easily accessible for inspection, lubrication and adjustment, thereby reducing the necessary repairs, incidental to every Brick Press, to a minimum. 3. Pressing 5 bricks at each revolution of Machine, keeps the regular force of off-bearers and setters fully employed, which a 4 Brick Machine cannot do. 4. The adjustment of machine from common to stock brick and vice-versa, can be made in a few minutes' time.

Besides the Press, we manufacture and furnish a complete set of clay preparing Machinery, Elevators, Mixers, and Rollers; also Engines and Boilers complete. We also build different kinds of Steamboat Machinery and Stieam Boilers, Corliss Engines, Cotton Compresses, Water Work Plants, Coal and Mineral Mining Machinery, Bridges Work, Hoisting Travelers, Cranes and Elevaters; also general and large castings and Machinery. Any further information cheerfully given.

TESTIMONIALS.

Kansas City, Mo., September 28, 1888.

St. Louis Iron and Machine Works, St. Louis, Mo.

Gents: The two "Lion" Presses I bought from you about two years ago have given me entire satisfaction. As a dry clay press I think they have no superior. I prefer the "Lion" to the "Hydraulic". Ever wishing you success with the "Lion," I am,

Very Truly Yours, DRURY UNDERWOOD.

OFFICE OF
Tenneseе Brick Manufacturing Co.,
NO. 7 MADISON STREET,

Memphis, Tenn., September 28, 1888.

St. Louis Iron and Machine Works, St. Louis, Mo.

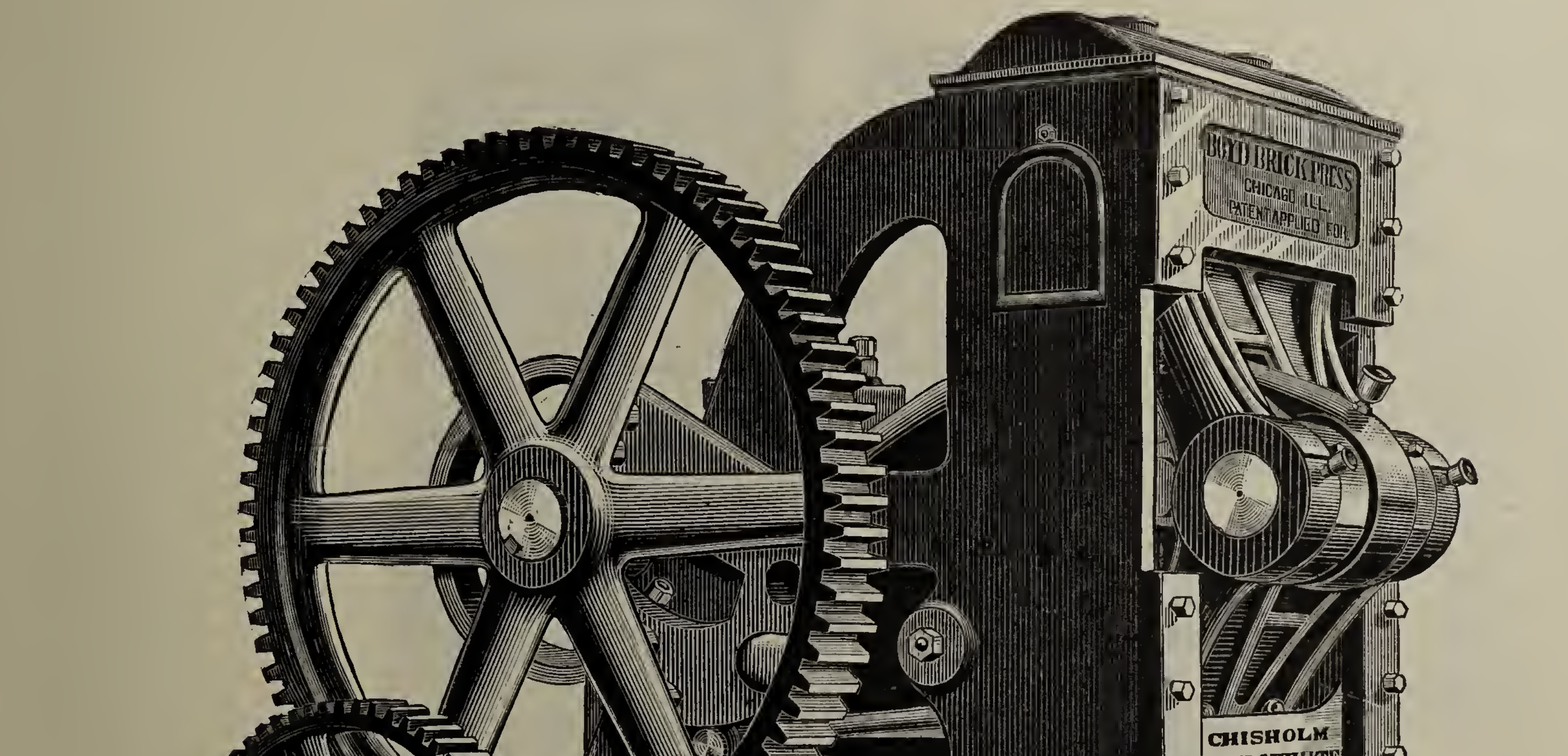
Gentlemen: In reply to yours of 25th inst., we beg to say that our Company contracted with you last spring for one of your "Lion" Brick Machines, having concluded, after our President and Superintendent had thoroughly investigated most of other machines, including the Hydraulic, that yours possessed more advantages and promised better results. In due course the machine was delivereed, set up and put into operation. After having operated it all summer to full capacity, we are more than pleased with results and can heartily recommend the Machine to any one contemplating a purchase. To fully appreciate the merits it must be seen performing work.

Wishing you that eminent success which you so well merit we remain

Yours Truly, C W. EDMONDS, Sec. and Treas.

THE BOYD BRICK PRESS

Will make a greater quantity of Perfect Brick (of maximum weight) per mould for a consecutive number of days than any other Semi-Dry Brick Press in the world and Superior in Quality to Hydraulic Pressed Brick.



☛ Correspondence Solicited.

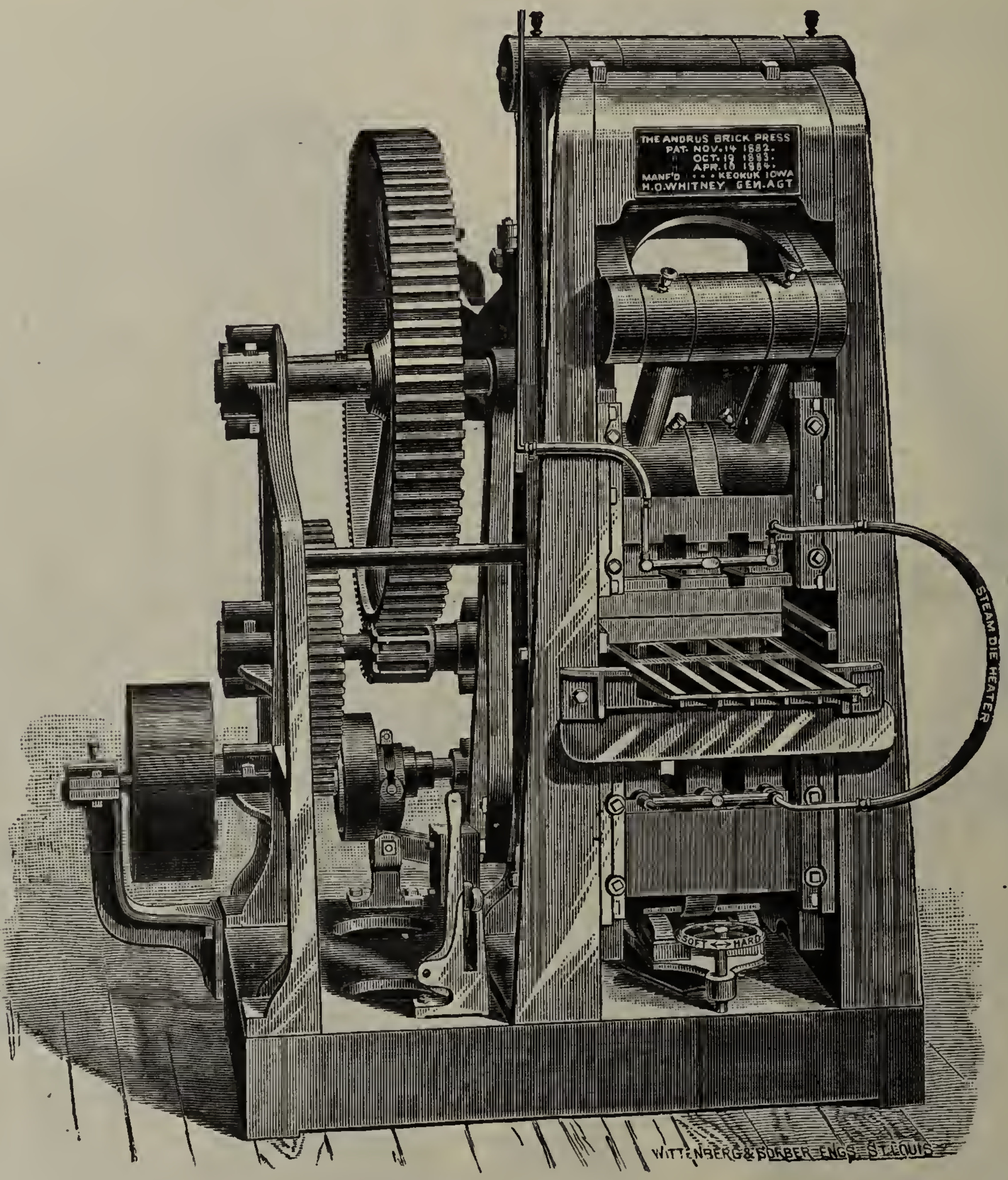
CHISHOLM, BOYD & WHITE,

86 Adams Express Building, CHICAGO, ILL.

THE

Improved Andrus Double Pressure Brick Press.

UNRIVALLED FOR SIMPLICITY, POWER AND DURABILITY.



The Pressed Brick made on the Andrus Machine have been tested by the U. S. Government and adopted for fronts in Government Buildings.

Built at our OWN FACTORY with heavy forged STEEL pressure arms and fully guaranteed against breakage. Not an experiment but a TRIED and PROVEN success.

60 machines in successful operation the past season. Examine it before purchasing.

Ittner Bros., St Louis, Mo., using the Andrus Presses produced 36 large kilns of brick of unsurpassed quality he past summer.

Samuel J. Rose & Son, Chester, Pa., and many others have made a splendid success.

The Andrus Press, Clay Crushers and Pulverizers can be seen in operation at all times at Our Factory.

Send for descriptive circular and reference, address

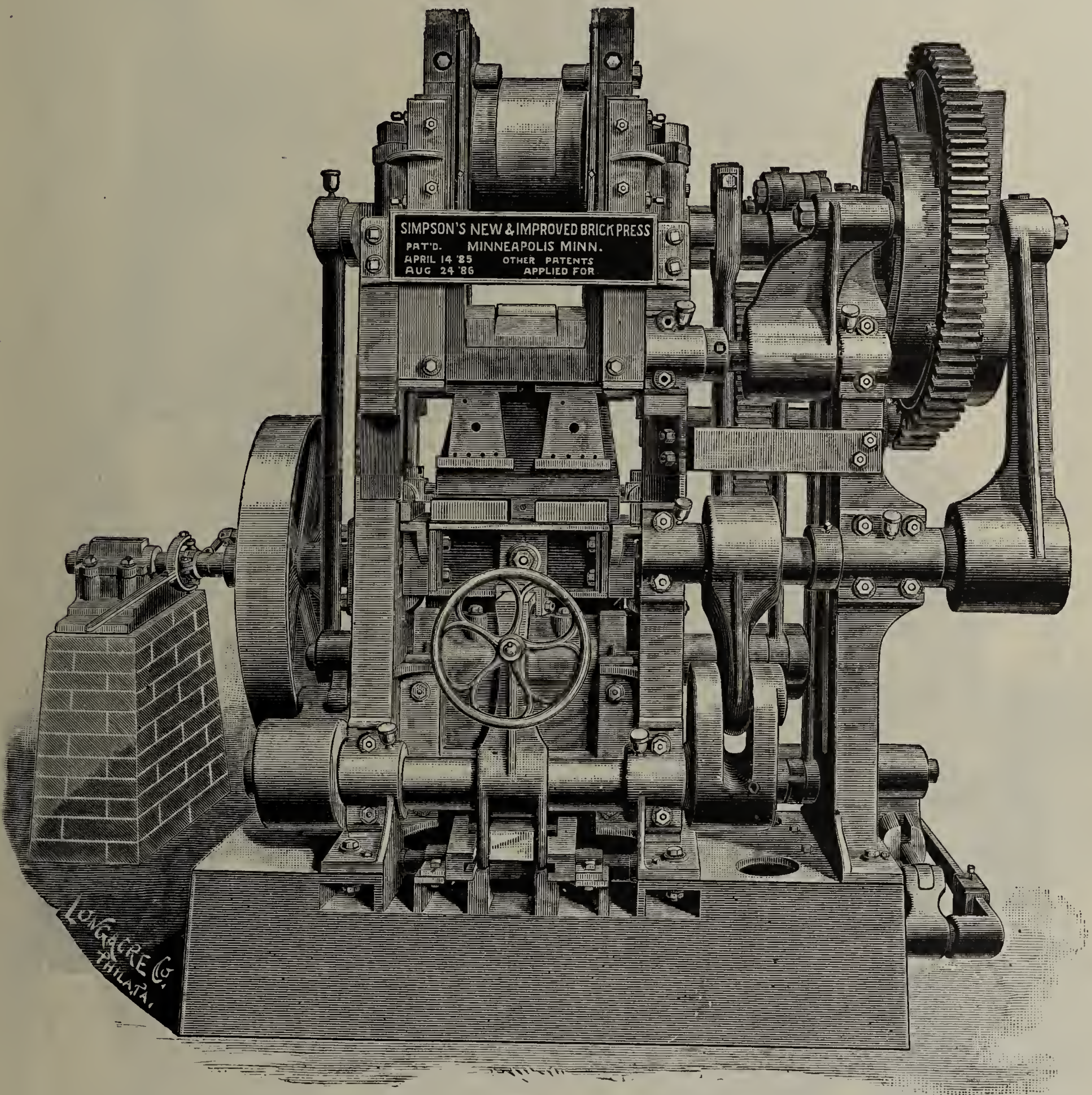
H. O. WHITNEY, Gen'l Agent,

General Office and Factory, KEOKUK, IA. (Mention the Clay-Worker.) KEOKUK, IOWA.

SIMPSON'S NEW

AND

IMPROVED BRICK PRESS.


SIMPSON'S NEW & IMPROVED BRICK PRESS
PAT'D. MINNEAPOLIS MINN.
APRIL 14 '85 OTHER PATENTS
AUG 24 '86 APPLIED FOR
LONGACRE CO.
PHILA, PA.

Send for particulars and prices

SIMPSON BRICK PRESS CO.,

Room 91, No. 159 LaSalle, St, CHICAGO, ILL.

Improved Eureka Dry Press Brick Machine.

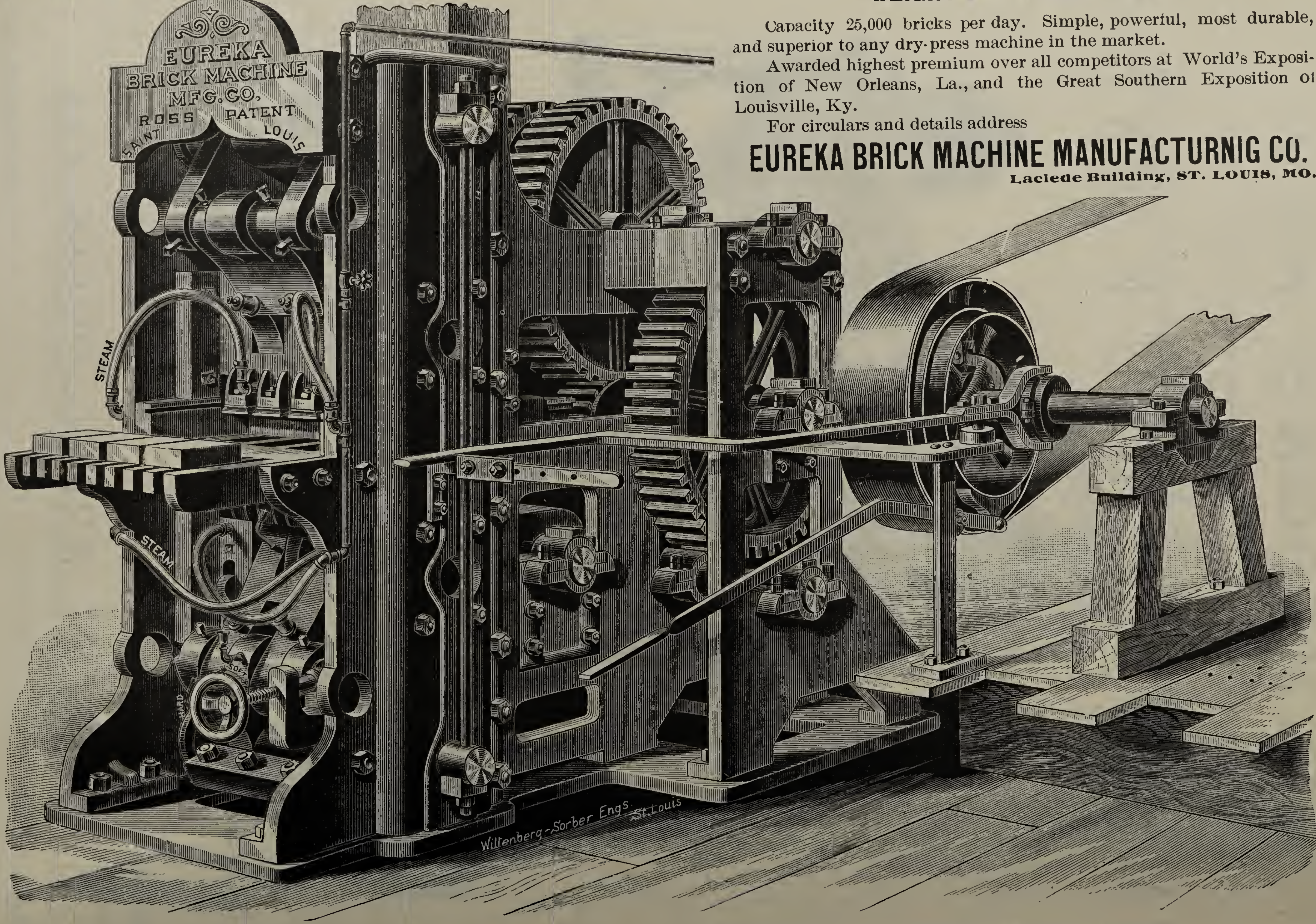
WEIGHT SEVENTEEN TONS.

Capacity 25,000 bricks per day. Simple, powerful, most durable, and superior to any dry-press machine in the market.

Awarded highest premium over all competitors at World's Exposition of New Orleans, La., and the Great Southern Exposition of Louisville, Ky.

For circulars and details address

EUREKA BRICK MACHINE MANUFACTURNIG CO.
Laclede Building, ST. LOUIS, MO.



EASTERN AGENCY, 1321 F STREET, N. W., WASHINGTON, D. C. FRANK P STONE, AGENT.

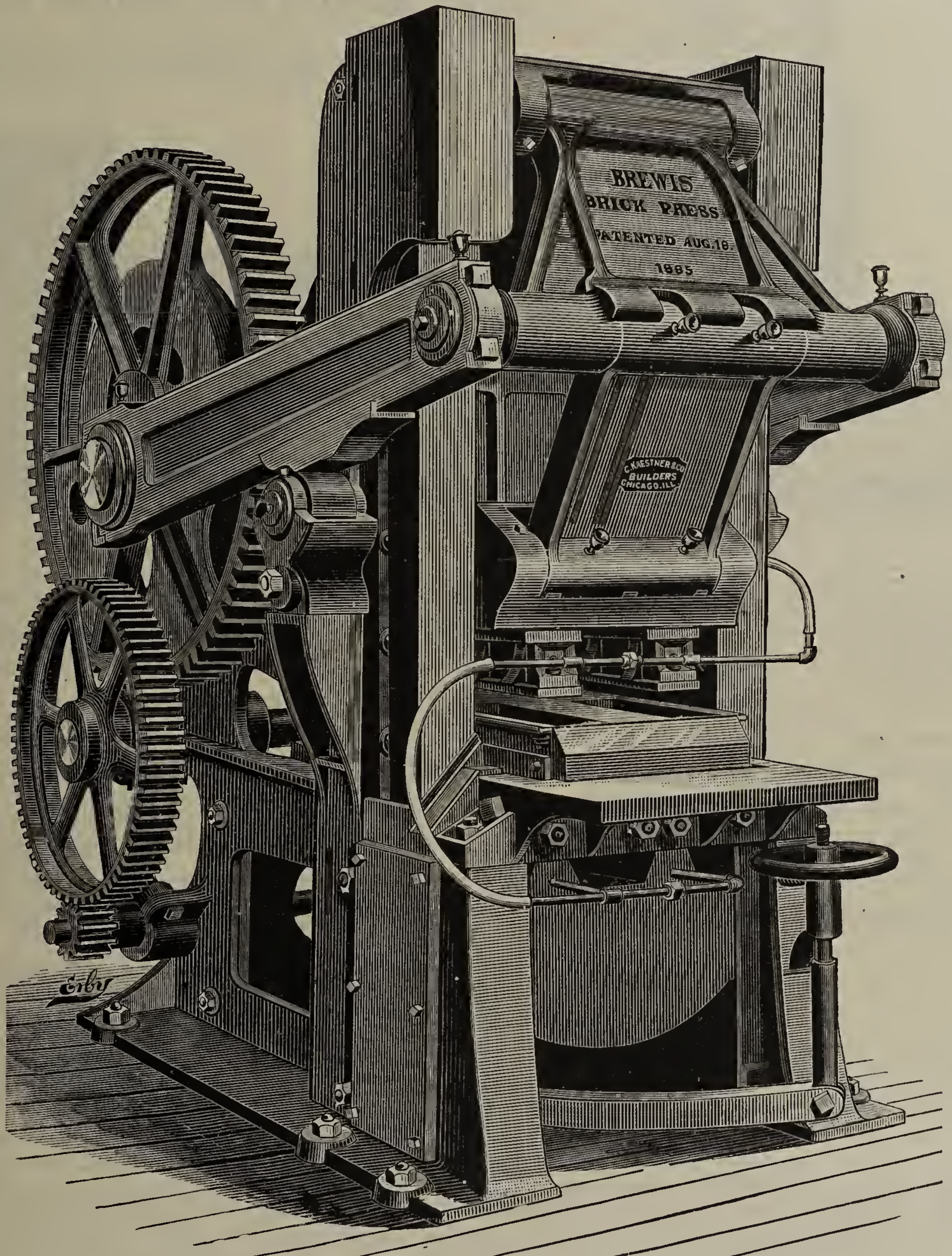
The Brewis Patented Brick Press.

SIMPLE AND DURABLE.

Guaranteed to make as many Perfect Brick per mould as can be made on any machine now in the market. We except none.

Fully covered by patents. **We protect our purchasers.**

Capacity 8,000 to 16,000 a day depending upon the clay



Shipped to responsible parties on 30 to 60 days trial.

Guaranteed against breakage for Two Years.

We furnish the Boyd and Raymond Pulverizers at prices that defy competition. Send for Circulars and Prices to

CHARLES KAESTNER & CO., Machinists and Founders,

ENGINES, BOILERS, PUMPS, SHAFTING, PULLEYS, HANGERS, ETC.,

[Mention the Clay-Worker.]

303-311 South Canal Street, CHICAGO, ILL.

I. & M. WOLFF & COLEMAN

THE "IRON CLAD"

STEAM DRIER.

Automatic,
Simple,
Efficient.

Features Radically Different from any other Drier.

Is Broadly Secured by Bona Fide Patents.

Buildings Not Expensive to Construct.

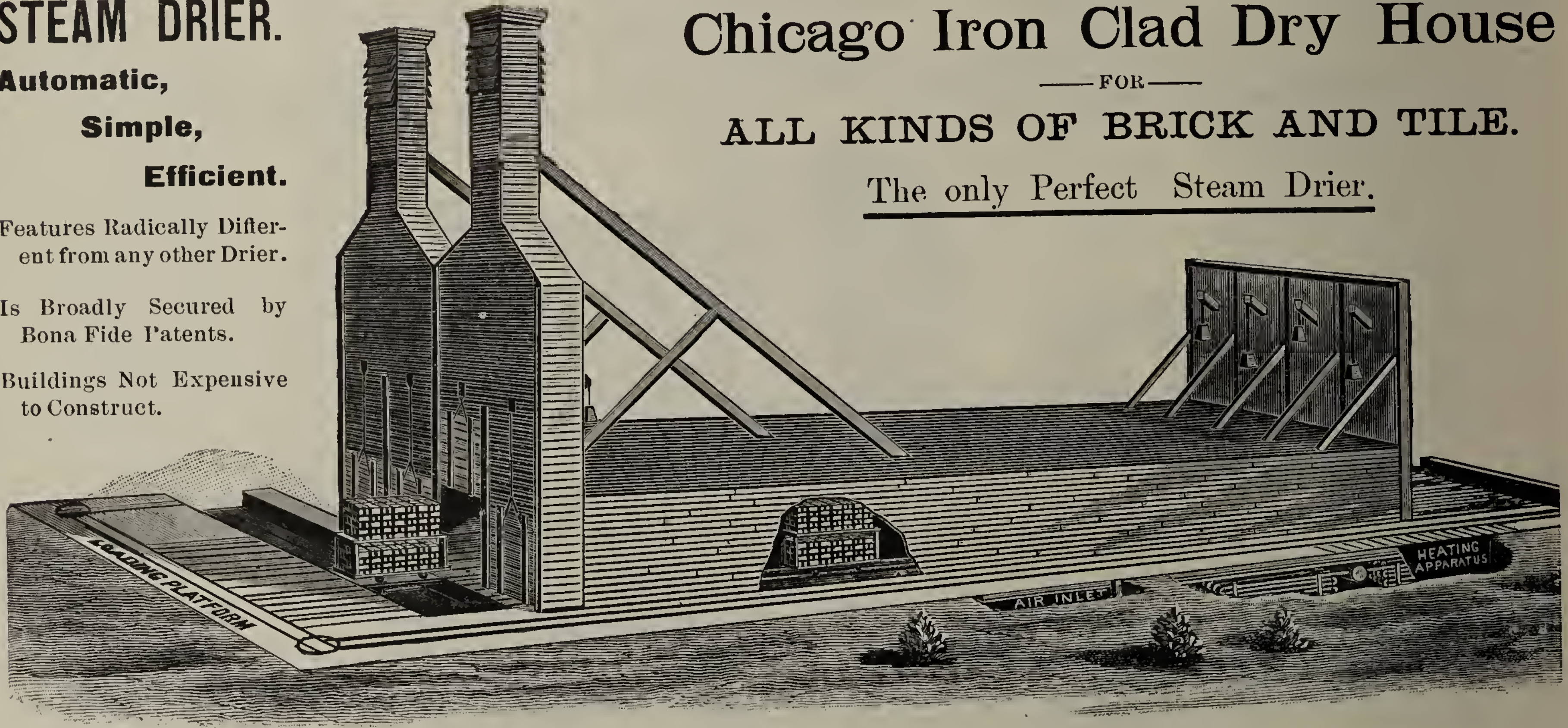
Patentees and Sole Builders
—OF THE—

Chicago Iron Clad Dry House

—FOR—

ALL KINDS OF BRICK AND TILE.

The only Perfect Steam Drier.



This Dry House is a combination of the Drying Floor and Tunnel System. The radiation from the Iron Floor extending over the heating coils dries the lower tiers of bricks. The perforation of the Iron Floor gives an even distribution of the heat and prevents cracking. The steam heat is not so intense as to melt down the bricks or bake them. The bricks are dried uniformly; they come out smoothly and burn evenly, with a good ring. The water-smoke is drawn off rapidly as made and the drying is even and gradual. Stiff mud bricks are haked on double deck cars and thoroughly dried in 24 hours. Soft mud bricks are dumped on pallets and cars carry the same through Dryer in 24 hours. Semi-dry and dry pressed bricks are specially provided for and can be dried without injury. We can convert other Dryers into our system, thereby improving product and capacity. Our buildings are constructed en-entirely of wood; are simple, cheap and easily erected. We furnish complete steam heating apparatus with pipes and connections, Iron Cars, Turn-tables, Transfer Cars, Rail and superintendence. Confer with us before contracting elsewhere. We will save you money time and trouble. State character of bricks made, name of machine used and capacity required.

CORNING, N. Y., February 11, 1889.

Messrs. I. & M. Wolff and Coleman,
102 W. Washington Street, Chicago, Ills.:

GENTLEMEN—Your Mr. W. C. Byrne arrived here one week ago to see how the Dryer which you people put in for us was doing its work. A part of the time that he has been here the mercury has been 10 degrees below zero and the brick has dried as well as in midsummer. The Dryer, size 28x76, is doing all that you claim for it and we are sure if your directions are properly carried out it will dry more than 20,000 brick per 24 hours. Before we purchased this Dryer from you we visited several places where the hot air Dryers are in use and had partially decided to put in one of them; but seeing your Chicago Iron Clad Steam Dryer, advertised in the CLAY-WORKER, we commenced to investigate the merits of your Dryer. Of course we were told that steam was a failure; but we saw it different and we must say that this Dryer has been put in by you people to our entire satisfaction.

Yours respectfully,
CORNING BRICK WORKS, by C. M. RUBRIGHT, Sec'y & Treas.

I. & M. WOLFF & COLEMAN,

PATENTEES AND SOLE BUILDERS,

Write for catalogue.

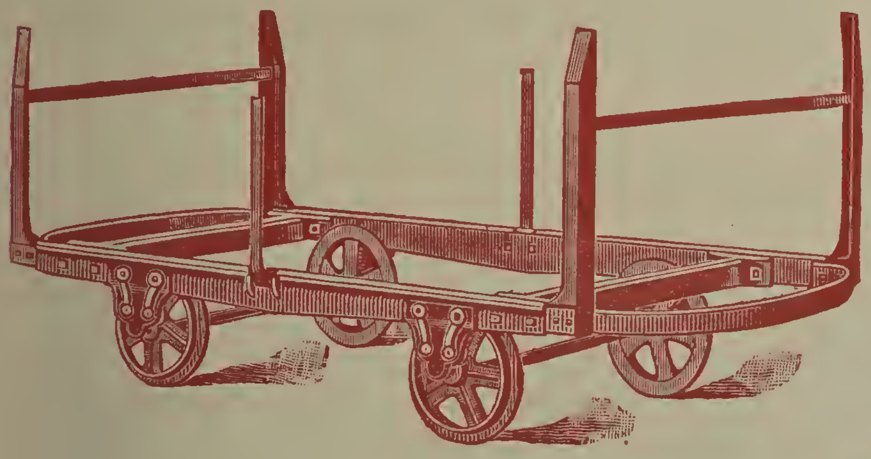
No. 261 Dearborn St., Chicago, Ills.

The Iron Clad Steam Dryer.

It will pay you to have your bricks thoroughly and equally dried before setting in kiln. You can dry them more economically in our Steam Dryer than in the kiln, besides getting a more uniform burn and better bricks. Handling and wheeling bricks costs money, and the bricks are often marred and in bad shape when they go to the kiln.

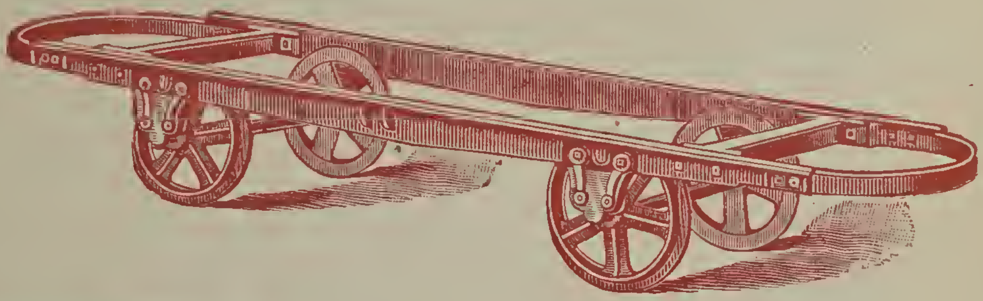
These trucks are strong and well made throughout, and the axles run in anti-friction rollers and are easily handled by one man:

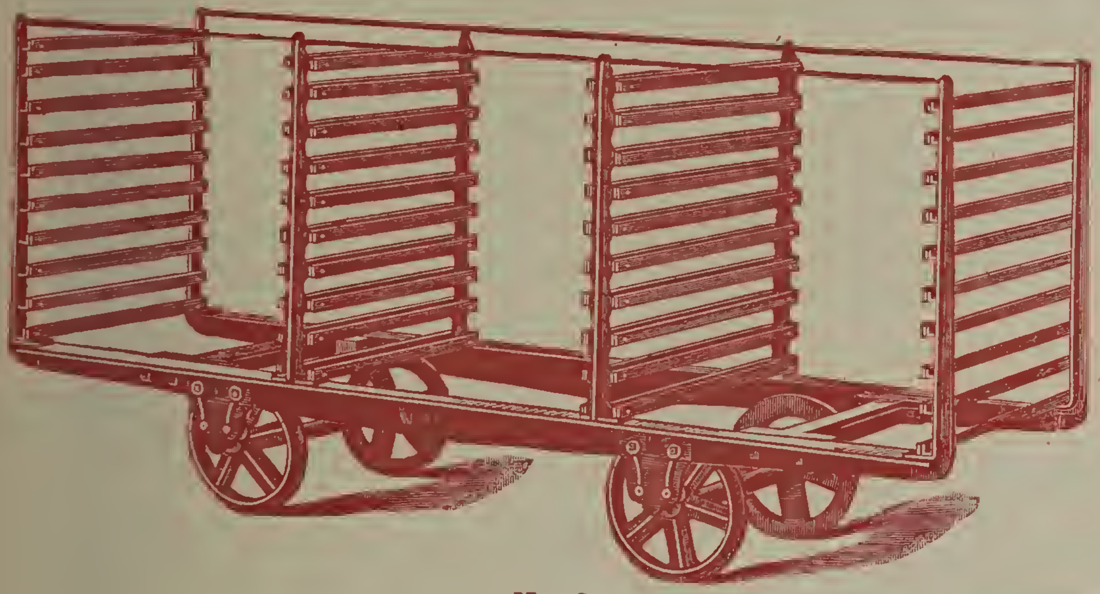
Cut No. 1 shows our double decked car, which we use for all the varieties of brick, sufficiently stiff to be haked; on the lower deck of which we hake four tiers high, and on the top deck five. This car is suitable for all of the stiff mud brick made by the various Die machines. It is also adapted for the drying of dry pressed and semi-dry pressed bricks.


No. 1.

Cut No. 2 is a simple frame car which is used for foot pallets, or this car can be converted into car No. 1 or 3.

Cut No. 3 is for bricks that are too soft to hake and when pallets are necessary.


No. 2.


No. 3.

These racks, together with the car, are constructed entirely of Iron. They will be found strong, light and durable, and afford the best method of using pallets. They do away with the use of the foot pieces on the pallets, which are so much annoyance in handling. The pallets are made to slide upon the wrought iron bars which act as braces for the posts. We make these racks for the pallets to slide in lengthways of the car, so as to bring the side of the bricks towards the heat and also afford conveniences of putting in and taking out the pallets. You can reach across the car easier than lengthways of it. These cars are 8 feet 6 inches in length, and 34 inches wide.

No. 4.

Cut No. 4 is a substantial as well as a light frame—made entirely of wrought angle iron, and strongly braced, which is to be used for a top deck in the car, in cut No. 1. ADDRESS,

I. & M. WOLFF & COLEMAN,

261 Dearborn Street, - - 14 Third Avenue,

CHICAGO, ILLS.

CLAY DRYERS.

We are prepared to erect Dryers to dry your CLAY as it comes from the pit.

YOU
Save expense of clay sheds.
Work during entire year.
Can always work your clay bank.

NO
Interruptions by rainy weather.
Delays by waiting for dry clay.

Each car carries enough clay for one thousand bricks.

Buildings Cheap to Construct.

River Falls Brick Company.
River Falls, Wis., June 20, 1889.

Messrs. I. & M. Wolff & Coleman,
Chicago, Ills.:

Gentlemen:—In relation to the value of the Clay Dryer you put up for us to dry our clay before going to the machine, we will say we are well pleased with it, and its use is necessary to prepare our clay for the machine. We load the cars by means of a steam shovel and when loaded with enough clay to make about 1,000 bricks, we run through the dryer in twelve hours and dump the dry clay at elevator and get enough clay for a machine of 25,000 bricks per day. Our Dryer is 22 ft. wide and 78 ft. long, is constructed of wooden buildings, and we use your Iron Clad System of steam pipes. We highly recommend the use of this Dryer in cases where it is found desirable to dry the clay before going to the machine and particularly in the drying of clay for the manufacture of Dry Pressed Brick. Yours truly,

C. A. Hawks.

ADDRESS

I. & M. WOLFF & COLEMAN,

PATENTEES AND BUILDERS OF THE

CHICAGO IRON-CLAD DRYER,

261 DEARBORN ST. AND 14 THIRD AVE.,

CHICAGO, ILLINOIS.

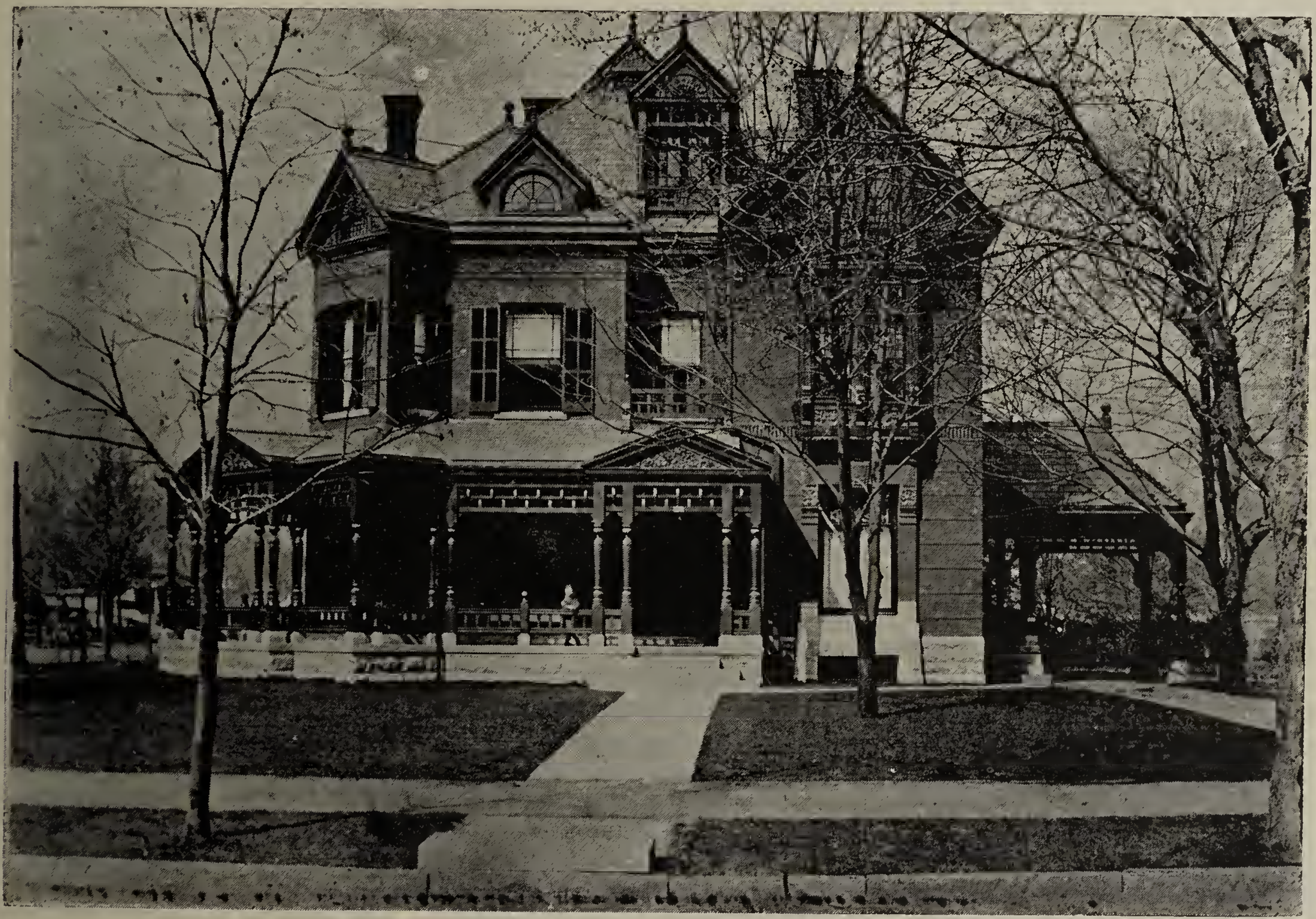
THE CLAY-WORKER

VOL. XII. INDIANAPOLIS, IND., JULY, 1889. No. 1.

Written for the Clay-Worker.

RESIDENCE OF DR. O. S. RUNNELS, INDIANAPOLIS, IND.

The United States is destined to become the best market in the world for artistic productions. In the development of a a new country the capital for a time is invested in laying the foundations for future wealth—in the clearing away of the forests—in the opening up of the highways of commerce and in the extension and establishment of trade relations. Our country has reached a point in the history of its development and accumulation of wealth that justifies the expenditure of money in the employment of the artistic, in beautifying the structures intended for public use and also the private residences of our people. The very general distribution of wealth among our people and the effect of teaching the several branches in our common schools that lead to the cultivation of artistic taste and an admiration for the beautiful is developing a wide spread demand for the beautiful in the decorations of the homes of the people.



RESIDENCE OF DR. O. S. RUNNELS, INDIANAPOLIS—*R. P. Daggett & Co., Architects.*

As an evidence of this expanding field of industrial effort, we present our readers with the illustration of the residence of Dr. O. S. Runnels, of this city, situated on the northwest corner of Meridian and Second Streets. The building is modernized Romanesque in style and was designed by the well known architects R. P. Dagget & Company, of this city. It is built of stone, brick and terra-cotta and especially adapted in its arrangement for a dwelling and office combined. The brick used in the walls were manufactured by the Adams Brick Co. of this city and were laid by Mr. John C. Pierson. The brick for the outside walls were carefully selected—of uniform color and size—the outside courses were laid in red mortar with as much care as is usually exercised in the laying of pressed brick. The terra-cotta was manufactured by the Indianapolis Terra Cotta Co. and in artistic execution of design and in quality of material it is at least equal to the product of any Company in this or any other country.

The entire structure, so faithfully copied by our own artist, exerts an educating influence upon the public who throng this fashionable drive; and that it may further serve in developing an artistic taste, we take pleasure in presenting it to our readers.

Written for the Clay-Worker.

BRICKMAKING AND BURNING.

No. 4.

BY J. W. CRARY, SR.

In my third article I gave the common old mode of setting and burning brick. As some persons who are inexperienced and have not read my former articles may profit by a partial repetion of the same, I will state that when a kiln is ready to "fire," the main thing to consider is a "good burn," not a quick burn or a fuel saving burn. It is a foolish boast of the botch burner to talk about his quick burn. This is so common that it is quite the rule to make a bad burn just to brag about the time and fuel saved. Look a moment at the utter nonsense and certain loss of this costly practice of ignorance and self-conceit.

You have been to all the expense of making and setting ready for burning, say 200,000 brick. Now as a common old rule, it will take at least sixty cords of the best kind of wood or about thirty tons of coal, to burn this kiln, or its equivalent in gas or any other fuel, and this is supposing that the kiln is in first rate order for burning, that the clay is easy to burn salmon, *i. e.*, will indurate under a low heat, that the weather is favorable and that the help is ample.

Now suppose when the 60 cords of wood or the 30 tons of coal are used up on the fourth or fifth day of burning, the kiln be closed with 50,000 salmon brick and 10,000 pale red brick. Now the difference between this and a good burn is at least 40,000 salmon and 8,000 pale red. Loss by 40,000 salmon, $80 at least; on 8,000 pale red, $20, equals $100 loss in selling price besides loss of labor in handling, $10, equals $110.

Now suppose the "boss burner" to be competent and that he tells his employer that he can make a first rate burn if he has five cords more of wood or its equivalent in the fuel he may be using, and 10 or 12 hours more time. The cost would be say $15 for fuel and $5 for labor, equals $20; but "no," is the answer and the kiln is closed up at a loss of $90 together with the bad name "poor burn," "poor brick," or "salmon burn." So here is the actual damage of $90 and an unknown incidental loss in reputation.

I have known hundreds of kilns to be treated in this way. In fact, first rate brick burning is the exception, not the rule. I have burned a kiln of reset salmon brick in twenty-six hours and several kilns dry, green brick in three days and nights, and although they were called good burns I found that in the same clay I could make a brick 50 per cent stronger by burning six or seven days and with only a trifle difference in cost.

TRUE THEORY OF BURNING CLAY TO PERFECTION.

Six pounds of strong clay when dry as the air will make it, still contains from six to eight ounces of water and brick set up in a kiln will average ten ounces of water to each brick. The pores of a mud brick are very small and of a dry pressed brick still smaller. Now it is perfectly plain and evident that when a brick be heated above the boiling point, an instantaneous expansion takes place in the absorbed water and the crystallization or cohesive attraction of the particles of clay must be disjoined to a certain extent so as to allow the excess of steam to escape. The whole body of the brick is thus suddenly expanded and softened and if not perceptibly "water settled" it is in fact so, to a certain extent, and however hard the brick may be burned it will be imperceptibly fractured and loose its ring and solidity.

IN THE DRYING OFF PROCESS.

Brick should never be heated above the boiling point until the top of a kiln is quite warm to the touch all over. After this, the fires in the arches may be slightly increased so that the overhangers will look a little bright after dark, but in no case should the furnaces or arches be made red hot until the steam or water smoke begins to disappear rapidly. There are two words for a brick burner to get by heart and never forget, viz., slow and regular. If the aphorism "more haste than good speed" has one place better than another it is in the practice of the average brick burner trying to save time by pushing his fires or opening his kiln too soon after being burned. No matter how little or big the kiln, if the height be the same, it requires the same length of time to burn it. I have burned 700,000 brick in a kiln 48 brick, on edge, high, in a little less than seven days. The kiln did not settle a particle, was perfectly hard from bottom to top; and I have been a full week burning 100,000 the same way in the same kind of clay.

If the settle of a kiln be the criterion for a good burn, the slow, steady heat well diffused throughout the kiln is the only sure way. A settle should never be attempted until the fires are all out to a glowing heat on top. The man who settles his kiln until in this condition, is either a willful botch or a senseless ignoramus.

HOW TO MAKE AN EVEN SETTLE ALL OVER THE KILN.

The old way of setting one head or side at a time is an exploded idea with brainy brick burners. A clamp or kiln twenty-two feet wide should have a furnace at least four feet deep, or out, from the brick in the kiln. If the wall of clamp or kiln is not that thick, a flue or furnace should be built out so that the main part of the gases generated by the furnaces will not be mixed with fuel (wood or coal) thrown over into the arches. The old idea of sliding or throwing large quantities of fuel over to the center of a kiln is a positive waste of fuel, without any really beneficial result. If there be a deficiency of oxygen to consume the wood or coal thrown over to the midde of arches the fuel will carbonize and that will retard or even destroy combustion. If coal be used, the grates should be thinly covered and the ashpits should be often cleaned out. When any part of the kiln begins to settle, the plating should be closed tight at that part so that no more draft will concentrate at that point but be forced to other unsettled parts of the kilns. This process of closing the plating should go on until the settle is even all over the kiln, and if the plating cannot be made tight, raw, damp clay should be thrown on so as to compel the draft of heat to go to the unsettled places. By this means I have often settled a head clear out nearly level with the middle.

WHEN THE KILN IS TO BE CLOSED AND HOW.

If the clay will fairly settle six inches, as soon as it has gone down four you may safely believe it will settle two inches more because the top of the kiln being closed the intense heat below will naturally ascend and as it can only radiate from the top, of course, the heat will be very nearly equalized throughout the kiln and the second course from the top will be good hard brick. When the kiln is to be closed no fresh fuel should be added to the furnaces and the gases have been consumed, so that no smoke is visible, should be spent until the arches have an even glow of a settling heat, then quickly close the doors and shut off the draft as soon as it is safe for the grates, which will not exceed one hour. The usual way of charging the arches with fuel on closing up a kiln, is sure to discolor many of the brick, because the combustion, or rather, the consumption of the the fuel, for the want of oxygen, is incomplete, and the carbonic oxide discolors the mineral oxide which gives the natural color to brick.

We see and hear a good deal about burning brick with natural gas. This is an important subject in localities where gas can be had, but in most places we must generate the gas by the proper combination of some kind of fuel and oxygen. Brick burning is not a question of fuel or heat, but a question of the right and best application of heat, and cooling or withdrawing of heat. It takes a certain quantity of heat, or caloric, to produce that chemical change in clay necessary to oxidate its natural constituent parts to that state of induration which affords the most consistent hardness, strength, tenacity and durability.

THE SETTLE OF A KILN NO SURE SIGN OF A GOOD BURN.

That kind of clay which is generally used to make the best red brick, will shrink about an eighth of an inch in the width of a brick; that will give five inches settle in a kiln forty brick high. But we often find such a kiln settled 8 to 10 inches or more and the arch brick a half inch less in width than a brick in the middle of the kiln and in the difference in settle from the bottom to top is in ratio to the number of courses. This may be called good burning but it is because there is no better. Why not have the superlative and get the best? It is simply a question of time, distribution and equalization of heat. Any experienced brickmaker of first rate judgment and sense (and no other sort of a man ever was or ever will be a first rate brickmaker) will soon find just how much heat his arches will stand without signs of fusion. Then if the brick are properly set so that a free, clear draft can ascend, he has only to keep the heat steady, uniform and regular, until the same color or glow of heat can be seen down a course or two from the top as is seen in the arches and when this sign is plain and unmistakable, he may close the kiln without regard to the depth of settle, and uniform well burned brick is the certain result. Any other criterion for a good burn is deceptive. The settle of a kiln may be mostly in the arches while two-thirds of the brick above are only pale red and salmon.

In my next article I will say something about our infusible clays that don't shrink in burning and require intense heat and will also tell common brick burners in fusible clay how they can make their arches stand fire. Before I conclude these articles I will show how to utilize the heat of kiln after being closed to dry off other kilns which can be set up at little expense for continuous burning. I will say right here to finish my remarks about setting arch bricks, that the common way of setting benches and overhangers, by setting one brick on two, right over the space beween the two, is without reason or common sense as it only makes cavities or ovens which confine the heat and gases not allowing escape up into the body of the kiln. The benches, overhangers and binders should be set skentling (reversed diagonally) with a space between at least 5-8ths of an inch. There should be a free full escape for draft up from bottom to top of kiln. "Benches" may be four brick wide for clay easy to melt and five brick wide for clay that will stand a high heat.

Written for the Clay-Worker.

CLAY, IN ITS CHEMICAL, MINERAL AND ECONOMICAL RELATIONS.

BY PROF. R. T. BROWN.

Familiarity breeds indifference, is one of the strange truisms that characterizes our common humanity. The things that are constantly before us we know less about than those which we see only occasionally and at long intervals. Clay is in the soil we cultivate and in the earth we walk upon daily. Scarcely an out-door hour passes that does not give us an opportunity to study the properties of clay and yet how little do even intelligent men, know about it?

The solid mass of our globe consists, substantially, of three proximate elements, to-wit: Silica, Alumina and Calcia, or in plain English—quartz or flint, clay and lime. The other thirty or forty mineral substances known to chemists are but auxiliary to these and are comparatively rare while these are found almost everywhere. Clay and lime are oxides of metals and silica is an oxide, but the metallic character of its base has not been demonstrated. Aluminum is a white metal nearly as hard as silver, admits of a high polish, but has not the lustre of silver. Its specific gravity is 2.60, being but little more than 2½ times as heavy as water. It forms alloys readily with other metals the most valuable of which are those with copper and iron. It is the most abundant of metals and yet maintains a high commercial value in consequence of the difficulty of reducing it to the metallic state. It forms but one compound with oxygen, that is what us chemists call a sesqui-oxide. It consists of two parts of aluminum combined with three parts of oxygen. This is the compound known as alumina. It is a feeble base and combines with acids to form alums and similar salts, but in the presence of a strong alkali it acts the part of an acid.

In this way, it combines with potassa and this compound unites with silica to form the mineral known as feldspar which is a constant ingredient in granite and other primitive rocks. In our bowlders it appears as beautiful crystals, generally flesh-colored and softer than crystals of quartz. It is from the decomposition of feldspar that all our clays are derived. Our clays are, therefore, silicates of alumina; but in the ordinary form of clay it is, in chemical language, a tri-hydrate; that is, each atom of clay combines with three atoms of water which it holds at all temperatures below 360°, at which heat it parts with two of these atoms of water, but holds the third up to a white heat, at which point it yields up the remainder with a shrinkage of about two per cent. of its volume. The first loss of water is visible in the water-smoke of a kiln. This loss is accompanied with little or no shrinkage, the space occupied by the water remaining as pores. But when the final equivalent of water is displaced, the heat has reached a point at which the material has become so soft that when the water is driven off the space it occupies is closed and the whole size of the brick is diminished by that amount. This is seen in the settling of the surface of the kiln and indicates the desired change in the chemical composition of the clay. A brick, or other clay work, is never effectually burned till the water of hydration is all removed. After this change we know of no process by which the clay can be hydrated again and restored to its original plastic condition.

If uncombined silica be present with even a small amount of lime or potash, (which is generally the case) vitrification will commence at a temperature but little beyond the point indicated above. This will demand caution in any increase of heat after the kiln has begun to settle.

Pure alumina has never been fused by any heat we have been able to produce, but we know that in the great laboratory of Nature there has been a heat sufficient to fuse it, for we find it crystallized in the sapphire and ruby which would demand a liquid condition. These gems are pure alumina crystallized and except the diamond, are the hardest substances in nature. Corundrum is an uncrystallized form of alumina and in a pulverized condition it is known as emery. We have a number of minerals of which the silicate of alumina is the base. Prominent among these are feldspar, chlorite, hornblende, talc and the various forms of schistose rocks, of which the roofing slate is a good example. Indeed, there are but few minerals in which alumina in some form is not a constituent element. Its chemical properties are peculiar. While its affinities are not very active, yet when it forms combinations with other bodies, they are the most persistent and difficult to break up of any in the whole range of chemical action. This feature interposes the chief obstacle in our efforts to reduce aluminum to its metallic state and it is that which gives to well burned clay its unlimited durability.

In the useful arts, clay occupies so broad a field that the limits of this paper forbids that we should attempt to more than enumerate a few of its economical properties. Clay has a strong affinity for the elements of organic bodies, as decomposition liberates them. Animal or vegetable substances covered with clay but a few inches deep will, undergo decomposition without any indication of it on the surface. Dry clay will absorb and hold its own weight of water, and yet it is not soluble in water, even in the smallest degree. In agriculture, clay is an indispensable element in a fertile soil and yet it enters none of the growing crops. Lime and silica, the other mineral elements of a fertile soil are found in nearly all growing vegetation, but clay while it ministers to all the wants of a growing plant, furnishing moisture and the fertilizing gases, yet of its own substance it furnishes nothing.

Clay is the only known substance that can be reduced to a plastic condition in which it can be moulded or wrought into any desirable form and that shape made permanent by heat and retained indefinitely against the destructive agencies of fire, water and time. These properties point to clay as the most valuable building material of which architecture can avail itself, not only for substantial walls but for durable and cheap ornamentation as well. Even in its unwrought state clay bids defiieance to time. Had our ancient mounds been built of stone, the progress of decay would have given us a data from which to have estimated their antiquity; built of clay as they are we have nothing on which to base even a conjecture of their age.

It requires no prophetic ken to see that in the progress of the arts these wonderful properties of clay will be made to minister to human wants in a thousand ways of which we have no present apprehension.

Written for the Clay-Worker.

COLOR OF CLAY WARES.

BY D. W. STOOKEY.

The subject of color in clay wares is one of the most difficult as well as the most interesting problems with which the clay worker has to contend. He very often finds some pieces of his ware that are colored a beautiful and popular tint and fancies that he has both fame and fortune in this particular bed of clay, but experiment teaches him that the desirable color in ordinary clay wares is an *ignis fatuus* that eludes his grasp until, like the deluded traveller who pursues the mirage on the sun heated desert, exhausted and dejected, he despairs of ever realizing his once fond hopes and becomes a victim of the fickleness of the color goddess.

As the intelligent, inquiring mind has penetrated the mystery of the Will-o'-the-wisp and learned the secret of the tantalizing mirage, so careful observation, aided by known scientific truths, may go far towards learning the whys and wherefores of the apparently unaccountable variations in the color of burned clays.

In these days of art educations and cultivated eyes the public requirements have become more and more exacting and the color problem of the clay burner proportionately more difficult. Slight variations in the color of the brick in a wall are readily detected and the artistic combinations of differently colored pieces of brick or terra cotta work require great nicety in the selection and arrangement of variously tinted pieces.

In this connection a few reflections on color in general may not be out of order. Color has been defined as a property of light. In Webster's unabridged dictionary the following definition is given: "A property depending on the relations of light to the eye, by which the mind is capable of distinguishing individual and specific differences in the hues and tints of objects which are apprehended in vision." Here color is made dependent upon the existence of the eye, whereas, the grass would be as green and the snow as white if no eye had ever been created to "apprehend" them. This brings up a discussion based upon the definition of the word similar to the old one with reference to the sound produced by firing a cannon beyond the hearing of all ears. But such discussions are only suited to the country debating society.

Sunlight is accepted as the standard by which all lights are compared and is considered as white light or pure light.

If a pencil or ray of sunlight be allowed to pass through a prism it becomes dispersed or separated showing all the tints of the rainbow. These colors imperceptibly merge into each other, but it is customary to consider them as seven principal colors. Bodies have the property of reflecting a portion of the light they receive, and their colors result from the fact that a part of the colored rays contained in white light is absorbed and a part is reflected. Those bodies that reflect all the rays they receive appear white while those that absorb all seem black. A body that absorbs all but the yellow rays seems yellow and one that only reflects red rays looks red.

As chemical action and mechanical structure or condition as induced by heat are the results sought after and obtained in the process of burning we may learn something about color as produced in the kiln by studying this subject of heat as an agent in producing chemical changes and as a modifier of physical condition. Heat is an important agent in producing chemical action and it is well known that certain chemcal combinations and separations takes place more readily and rapidly by the application of heat. A very common example of this is found in the burning of coal and wood. The carbon of the fuel may be in contact with the oxygen of the air but they do not combine rapidly to form carbonic acid until heated or a fire is started. Again the ingredients of a match do not unite until heated by some external means such as friction. Sulphur and oxygen do not act upon each other at ordinary temperatures but they readily combine and form sulphurous acid when the temperature is raised. Certain compounds are decomposed by heat which imparts to their elements an unequal expansibility. This is true of many metallic oxides. Iron disulphide, which is commonly called iron pyrites or fool's gold, readily decomposes when heated. The sulphur and the iron each uniting with the oxygen of the air. In a similar manner heat facilitates chemical change between the constituents of the clay. As the temperature rises chemical action becomes more vigorous and new combinations between the ingredients of the clay are formed. Color is also modified by the kind of fuel used in burning the kiln. Fuels have impurities and many of these are volatile at the temperature reached in burning clay wares. Some of these volatile substances unite with the constituents of the clay and thus influence the color. A familiar application of this is used in the production of a salt glaze. This is obtained by throwing salt into the furnaces while the ware is heated to a high degree, when the salt is volatilized and undergoes decomposition on the heated surface of the ware causing a deposit of a fusible silicate upon it and giving it new colors.

Heat also influences the color of the clay product by melting some of the fusible constituents of the clay. These, in the melted state, combine either chemically with some other constituent or mechanically unite to form a mixture that reflects or absorbs light in its own peculiar manner. The melting point of any substance is constant and it will melt whenever the temperature reaches its particular melting point. With the graded temperature of the different parts of the kiln there will be places where this change has taken place and others where it has not. Different substances have different melting points and while the temperature of some part of the kiln may have reached the melting point of one substance it may be below that of another. Those places nearest the fires may have attained the melting points of several ingredients with a decreasing number as the distance from the sources of heat increase. As different changes take place at different temperatures there is a constant change in the clay as the burning progresses and the different parts of the kiln being unavoidably of different temperatures at the same time there will be, as a necessary consequence, a variation in color grading from the hottest parts of the kiln to the coolest.

The presence of water or moisture in greater or less quantities influences chemical action and as water is decomposed at high temperatures especially when in contact with certain substances as iron the condition of the kiln, fuel and wares, as to the moisture, will exert an influence upon the color of the finished product.

The ordinary clays are very complex in their composition and the fuels, with their attendant impurities, furnish an almost innumerable and ever varying list of ingredients. The possible separations and combinations of this host at the varying temperatures of the kiln may naturally be expected to produce a vast array of colors, shades and tints in the finished wares.

The difficulty in obtaining uniformity of color has stimulated much investigation and experiment and various plans have been tried to obtain the desired results. The simplest and most natural method is that of selecting the pieces when taken from the kiln and grouping them according to the different shades of color. Artificial methods have been practiced with varying results. These primarily consist in the use of coloring matter which is acted upon by the heat in burning in such a way as to bring out the desired tint. The coloring matter is sometimes mixed with the molding sand others incorporate it with the clay before it is given the desired form.

BRICK PIERS.

The only way to build a good and substantial pier of brick is to lay each course the full size of the pier, and not to, as is often done in this city, build up the outer four inches of the pier seven or eight courses high and afterward fill in the interior, as it is impossible to get proper bed or bond; brick of the hardest quality only should be used where heavy weights have to be borne. Avoid bats and use as little mortar as is necessary to get solid work. Make the size of piers so that whole brick can be used to obtain proper bond; tamp each brick after it is laid in position with a hammer or brick.

In small piers lay the brick on a bed of mortar and flush up solidly every course; in larger piers make a joint or rub on the bed and lay headers every fourth course. If bond stones are to be inserted, the joints should not be too tight, say from three-fourths to an inch in thickness, the larger the pier the larger the joint, and bedded high in the middle, and in no case on the outer edges of the pier only. Use cement in all morter in connection with lime, and wet the brick in all cases where there is not any danger from frost; where iron plates or cols set on bond stones, the plate should cover the bond stone as nearly as possible. The present custom of laying brick in dead walls gives one the impression that the quantity of work done is of far more importance than quality. The only way to obtain good solid brick walling is to either flush the joints solid with mortar every course, or make a shove joint; the former method takes too much time, and the latter is rarely done except in very heavy work.

The custom generally adopted is to spread the mortar on the brick (a portion only of which gets in the joints) and lay the brick on top, each succeeding course being bedded in mortar, but the longitudinal and cross joints are only partially filled. Grouting with cement mortar every two courses in height might be adopted for basements and first stories of buildings where unusual strength is required. Full headers for face brick are better than clipping, and should be specified for all heavy buildings. The face brick are often built up fifteen or twenty courses high before the backing up is done, and thus the wall is never well bonded and sufficiently tied together.—*Building Budget.*

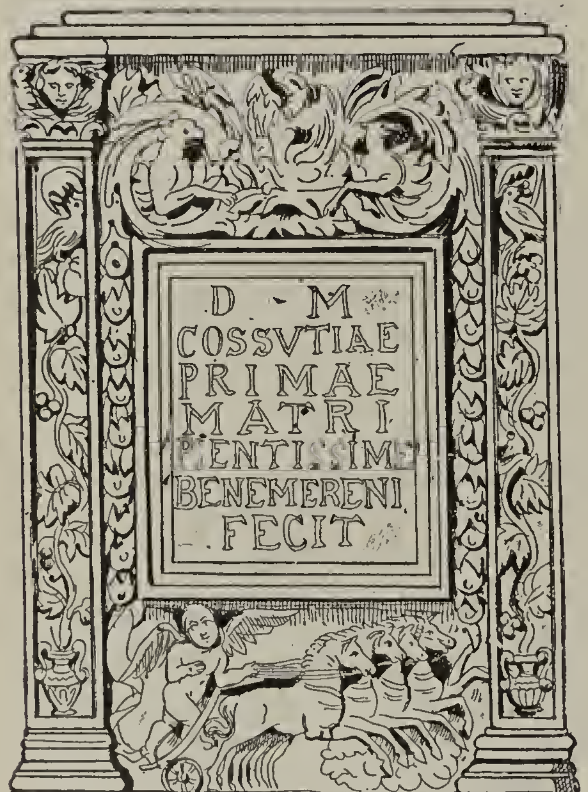
Written for the Clay Worker.

POTTERY.

BY H. C. WILLIAMS.

The terra cotta worker probably has often asked himself why it is that works reflecting upon his industry are so much given to pottery and so little to the more utilitarian productions that go into house building and the like. The answer is two-fold. In the modern sense, architectural terra cotta is too recent to have a history, and the ancient productions in this line have many centuries since crumbled back into the primitive clay—a few specimens from the mounds of Nineveh and the ruins of Rome represent nearly the total of our knowledge of the productions of the past.

Yet, few as these are, they have furnished models for most of the popular designs of to-day, and the magnificence of the ruins of terra cotta work, although the storms of thirty centuries have aided in the work of decay, tell us that as builders in terra cotta we are yet in our infancy. The writer was struck with the force of this idea as he passed a building in process of erection in this city. The body of the building was brick, the pilasters were of pressed brick (in which we can beat the most professional Assyrian brickmaker) interspersed at intervals with layers of rough stone. The capitals of the pilasters were pressed terra cotta imitations of palm leaf filagree, borrowed, without a particle of alteration from the conventional usage of an age in the prime of Assyrian terra cotta, and were borrowed bodily from the ruins of Nineveh. The effect in detail and combination was happy, and we hope to see more of this borrowing, if one were to call it such, for in all architectural work that is not meant to endure for an eternity, as in store fronts and dwellings, the terra cotta industry will be improved in its art and its pocket exactly as it adapts itself to the wants of the popular taste for adornment, and does it at a price that places its art within the reach of the popular purse—provided it can do it well—as well, for instance, as the worker of the old Nineveh did it. And remember that this almost anti-diluvian worker met the popular taste, because the entire building genius of this people was driven to clay for building material—to the mud flats of the lower Euphrates, and far from the stone quarries that developed the genius of other nations into stone productions. In this witness the Greeks, the marble Mount of Pentellicus, within a stone's throw of Athens, and an absence of clay, made the Greeks creators in marble. Witness again what marvels we Americans have made in wood—works of architectural art out of lath and shingles, and because we have had wood *ad naseum*,



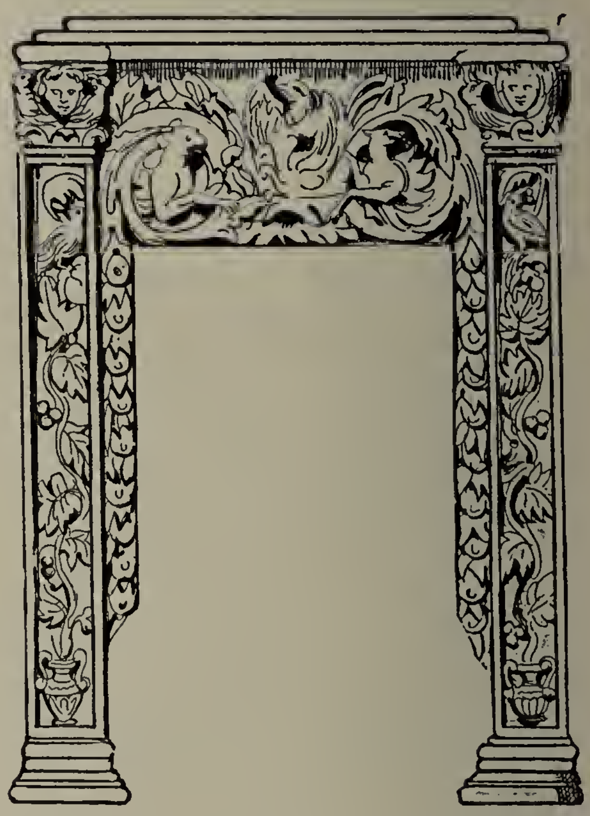
To be sure our clay is being opened, and what is more, developed into forms of art and beauty—and what is equally important, in a way that insures finish and durability (matters in which we beat the ancients). But as we said before, this development is so recent that it is just now bearing fruit.

But we begun by volunteering an explanation why fictile productions, as vases and the like so much predominated in works devoted to the terra cotta art. The urn, the amphora and the vase were nearly universally used as receptacles of votive offerings for the dead, and placed in tombs—structures that either were built in massive form above ground or were excavated out of it, and hence have escaped the ravages of time and the destruction of conquering hordes. Therefore they have survived, to tell us of the art materials that were common in the past. Besides, the best efforts of the art were expended in the ornamentation of these wares, and many of them afford studies that require but little of adaptation to render them subservient for decoration for almost any purpose that an artistic design could be used. In addition, their study will enlarge the mind and awaken the capacities of any in-born artist who will take the trouble to work the mine thus opened.

We do not urge upon the maker of builder's terra cotta to waste his time and energies in the decoration of vases, or "china" ware. This is the proper field only for one who follows this as a business, but we do urge that their decorative forms be studied for the fertility of conception they will afford, and the adaptiveness their many and beautiful forms will suggest, and which may be used in a thousand different ways to add to the beauty of architecture, and to educate the sense in the application and conception of beautiful forms.

There be those who would urge against this adaptation of the works of the past because of a fancy that one should create his work out of his own hand and brain. If a savage were to attempt to create civilization out of his own resources and single experience, we could readily imagine the "civilization" or rather the want of it. It has taken two hundred generations of men to produce what we have around us to-day. While we have gained, as to the whole, we have lost much that is valuable, and some that is indispensable. Civilization is the collective brain of all mankind, and it is the true genius who can take the work and art of another man, invented and used for a different purpose, and adapt it for a new purpose and one undreamed of by the original inventor. Napoleon, with all his genius condemned the invention of Robert Fulton (the steamboat), yet it is not going beyond possibilities to say that if he had adopted it he might have worn his imperial crown in London instead of wearing his soul out at St. Helena. In the light of present experience, he needed but this to wipe out at a blow the naval supremacy of England.

It is necessary for all who would succeed, to study the works of others, and it is absolute, if success be achieved that their work be properly adapted. There is really but little new under the sun. As an instance of this take the illustration which we present with this paper We give it in two forms. Fig. 1 is the bas relief on a Ciniary urn of the Roman period. Fig. 2, is the same with the inscription in the center and foot piece removed, and presto, we have a beautiful and artistic modern fire-place, that would be the "fad" anywhere it were introduced. The capitals of the pilasters on either side would serve with excellent effect at the head of the pilasters of a store front. The head piece would adorn a frieze, or take up any space required where a flat surface were to be relieved.



This illustrates what we mean by the capacity of adaptation and it illustrates also its method. It also illustrates the necessity for study of the works of men who have gone before, without this there can be no adaptation—or one so crude that it would fail in adaptation.

A little imagination will tell the reader a multitude of purposes that our illustration subserves, *if they be happily applied.* The world is full to overflowing with forms of truth and beauty, both in art and nature. The magnificent Corinthian capital, the very blossom of classic architecture, was borrowed, so 'tis said, by Callimachus who saw a basket covered with a tile in the center of an acanthus plant that was growing on the grave of a young lady of Corinth, and who copied it. This may be true or false in the specific sense, but it illustrates our text, the habit of observation and adaptation.

Written for the Clay-Worker.

GENERAL REMARKS CONCERNING BRICKS

Their Sizes, Strength, and Other Qualities, Ornamental Bricks, Blue Bricks, Etc.

BY CHAS. T. DAVIS.

Bricks are commonly rectangular moulded blocks of clay, burned, and used for purposes of architectural and engineering construction; but the term is also applied to the moulded clay in its crude and unburned condition, in which state the bricks are said to be "green."

Adobes are bricks that have been dried by the heat of the sun and not burned with fire, and they are used mostly in countries of the East and South that are free from frost, in which the atmosphere is dry and warm.

An adobe may be reduced to a state of permanent plasticity by being kept mixed with water, and again become clay; but a brick which has been burned can never be again converted into that condition or substance.

A burned brick may be pulverized into a powder, in which condition it will be a cement and when mixed with a small quantity of water will harden into a mass, or when mixed with a large quantity, it not being hydraulic, will settle at the bottom of the vessel and form into a substance resembling sand.

It is a fact peculiar to Spanish countries that ordinary brick dust, made from hard-burned, finely pulverized bricks, and mixed with common lime and sand, is universally successfully employed as a substitute for hydraulic cement. Mr. A. E. Miles says that during an engineering experience of some six years in Cuba his opportunities were ample for testing its merits, and he found it in all respects superior to the best Rosendale hydraulic cement for culverts, drains, tanks and cisterns, and even for roofs. In an experiment to test the strength of this product it was found that a block of it one-half inch in thickness without sand, and after an immersion in water for four months, bore without crushing, crumbling or splitting a pressure of fifteen pounds per sqare inch. It is thought that, by the addition of pulverizing mills to the brick yards to utilize the waste and broken bricks a profitable manufacture might be conducted.

American building bricks vary in size in different localities, and often there is a diversity in the same location the measurements for common bricks running from 7½ to 9¼ inches in length, 3½ to 4½ inches in width, and from 2 to 2¼ inches in thickness, which variation is largely owing to the nature of the clay employed.

Strong clays absorb a large quantity of water in tempering, and as the bricks made from this class of clays dry they become much smaller, and when placed in the kiln and burned their size is again greatly reduced by the action of the heat and bricks made from this kind of clay that were of a large size when moulded are often small and undersized when they come from the kiln. When this is so the strength of the bricks is not impaired, the principal objection to their use being that a larger number is required.

Bricks made from weak clays absorb but little water in tempering, and do not shrink much in either drying or burning. Both hand-made and machine-made bricks are similarly effected in size from these causes.

A difference in the thickness of hand-made bricks is often caused by the wearing of the moulds, new moulds being generally used in the spring, which gradually wear thinner until in the autumn they have lost from one-eighth to three-sixteenths of an inch in depth, and bricks made in the fall of the year being correspondingly thinner than those made in the spring. The loss of one-eighth of an inch in thickness of a brick may appear to be a very small affair; but it is not as insignificant as it may at first sight seem.

To lose one-eighth of an inch in one course of bricks in its thickness is to lose one inch in height in every eight courses, or one foot in every twenty feet of elevation. In a medium sized house, say 25 feet front by 60 feet deep and 60 feet in height from foundation to finish, the walls being one brick and one-half in thickness, which with chimneys and inside walls would girt about 200 lineal feet the loss would be about 600 cubic feet of brickwork or over 10,000 bricks as the walls would in that case require 18 bricks to the cubic foot.

The loss would also be in laying the quantity of extra bricks, and as the bricks and laying would cost in the neighborhood of, say $15 per thousand, a needless loss of about $150 would be inflicted either upon the owner or the builder, which would depend upon the circumstances governing the case.

The fact should be remembered, and engineers and architects having in charge large undertakings, requiring a long period for completion, and great quantities of bricks should expressly require that all moulds that are subject to friction and liable to loss of depth whether they be hand moulds or machine moulds shall be renewed not less than three times in each season. This should be done for the protection of their clients if they should be furnishing the bricks, and if not, then for the good of the contractor and also for the purpose of keeping the courses level and uniform throughout the work.

In the District of Columbia the authorities still enforce the ordinance of October 31, 1820, which requires that all moulds used for making plain bricks within the city of Washington shall be "stamped as correct by the sealer of weights and measures, and be 9¼ by 4⅝ and 2¼ inches in the clear."

"Stock bricks are to be made in moulds 2⅝ deep in the clear." All persons who violate this law are subject to a fine of $25.

English bricks are larger than those commonly made in this country, being usually 9 inches long 4½ wide and 2¼ thick, after burning, but they are not so strong, and are generally of an inferior quality.

In fact those made by the London brickmakers are of the weakest sort caused partly by the nature of the clay used but principally from the habit of mixing ashes in large quantities with the clay; as the domestic ashes which they use contain a large quantity of unburned coal, which is reduced to ashes in the process of firing, leaving the brick very porous, greatly weakened, and generally shaky. This system is very undesirable for two reasons: first it is certainly injurious to the health of those who live in the neighborhood of the stacks, as refuse, frequently mixed with decomposed animal and vegetable matter, the contents of dust holes is used in the process of burning; second, the matter of this kind which is sifted and mixed with the clay, pieces of bone and other substances of a similar objectionable character not being infrequent is certain to yield an undesirable excrescence arising from nitrogeneous substances, some of the evil effects of which have been described in the preceding chapter.

The most nauseating fumes often arise from the stacks of bricks made and burned in this manner as the "soil" or finely sifted ashes used for mixing with the clay is offensive to the smell in either a dry or moist condition; the coarser material or "breeze" contains some coal, but also a large quantity of rags, bones, oyster-shell, hair, corks, etc., all of which tend to make the immediate neighborhood of one of these clamps anything but a desirable place for a residence, especially in the hot close months of midsummer, which is the period during which the greater amount of this kind of brick burning is done. Day and night, for weeks and months, a great many people are compelled to breathe these sickening smells from this source, children pine away and die, the vitality of a great number of older persons is sapped away in the vicinity of these London clamps, and English people who never let an opportunity pass to find fault with our hygienic systems, and set themselves up for models for us to copy, and, in fact, they as much as say: "Look at us, follow us; we take good care of the body, we suffer nothing of a public character to undermine our health, while you do everything with such a rush that you do not take the time to pay any attention to the laws of health, and proper care of your bodies."

Outside of the heart or thickly-settled portions of London, I do not believe that there is any one thing that is doing so much harm by poisoning or polluting the atmosphere as this extensive system of clamp burning.

Suits to suppress this nuisance are sometimes brought, in fact, are not uncommon; but those who institute such proceedings generally push them with so little vigor, and do not appear to have made any organized effort through the co-operation and help of their neighbors to suppress the system, that the courts do not seem to have had the cases at any time properly presented to them, and the defendant generally escapes by the payment of a most insignificant fine.

The habit of some of the brickmakers at Haverstraw, Croton Landing, and other places on the Hudson River, of mixing fine coal with the clay has the same effect of weakening the bricks.

Pressed or front bricks are generally hand-made bricks that have been pressed when nearly dry in a hand press, and in their crude or green condition, they are called "gluts," and it is very essential that the clay of which they are made should be carefully selected and tempered. It should be free from gravel and other defective substances.

Machine-made bricks are sometimes repressed in a hand-press whilst damp, and make a second quality of pressed or front bricks, and generally sell for about one-half the price of the finer grades. Pressed bricks are usually slightly larger than common bricks, being generally made of weak clay in order to give them a rich color; but the same causes that have been named above as changing the size of common bricks apply to this finer grade of bricks.

Great pains are taken with pressed bricks to preserve the corners and edges which are called the "arrisses," and the brick are carefully taken from the kiln the defective ones being culled out, and the perfect ones assorted for a uniformity of color, the light-colored being hacked together, and the medium and dark-colored being also kept separate, all the culling, assorting and hacking being usually done under a shed built for that purpose.

Machine-made brick shrink less in drying but more in burning than hand-made bricks.

Burning common bricks are usually divided into three classes: arch, red and salmon; and when made from the same class of clay, the salmon bricks are the largest in size and the greatest in weight; the red bricks are the next in size, and the arch bricks are the smallest in size and least in weight. The average weight of burned bricks is about five pounds, but individual weight depends upon and varies with the size, the amount of pressure to which the clay is subjected in tempering and moulding, the heat received in burning, the class—whether red, arch, or salmon, the kind—whether made by a dry clay machine, a slush machine, a damp clay machine, or hand made. The average weight of a cubic foot of brick is 110 pounds.

Tredgold gives the average specific gravity of brick as 18.41 and the cohesive force of a square inch as 275 pounds. He probably got hold of a very weak brick, for when the cohesive force is less than 400 pounds, the brick is not worth laying in any building where strength is a requisite.

A good quality of hard-burned bricks, especially when intended to be used in buildings of a public character, when hand-made or machine-made, should withstand a pressure of not less than 7,000 pounds to the square inch, or about 450 tons to the square foot, which is more than good granite, and three times as much as good building stone will stand.

This may seem to be an extraordinary requirement, or it may be called an impossibility by some; but that it is not difficult to find bricks that will stand even this enormous pressure and some a great deal more, will appear from the following tests made by direction of Gen. M. C. Meigs, of the U. S. Army, who has been intrusted by congress with the erection of a building for the use of the U. S. Pension Office, and which is now (1884) in course of construction at Washington, D. C. The tests were made at the U. S. Arsenal, Watertown, Mass., from samples of bricks supplied by the competing bidders of Washington, D. C., and the neighboring city of Baltimore, Md., by compression between cast-iron platforms after the faces of the samples had been ground flat.

Below is given the pressure required to crush the samples, for convenience being numbered from 1 to 12:

ULTIMATE STRENGTH.

	Total pounds pressure.	Pressure per square inch.
No. 1 Red brick	324,500	9,540
" 2 Arch brick	255,200	7,600
" 3 Pressed brick	231,000	6,470
" 4 Red brick	296,200	8,530
" 5 Arch brick	324,500	10,290
" 6 Pressed brick	314,700	9,190
" 7 Red brick	211,000	6,050
" 8 Red brick	209,300	6,030
" 9 Red brick	232,000	6,700
" 10 Arch brick	203,700	6,800
" 11 Pressed brick	210,000	5,960
" 12 Pressed brick	249,000	6,750

For ordinary building purposes there is not the least doubt but that any of the bricks in the above list are more than amply strong; that are intended to go down to the coming centuries there are some that it would not be good policy to use.

The contract was awarded for 9,000,000 common bricks and 600,000 pressed brick to the owners of samples Nos. 4, 5, and 6, which was the Washington Brick Machine Co. The following table will show the manner in which the brick that were submitted as samples for the above tests were produced and the class of clays of which they were made:

How produced, class of machines used in making, etc.,etc.	Condition of clay when moulded.	Kind of clay.
No. 1. Hand-made	Tempered	Mixture of strong and weak.
" 2. Dry-clay machine	Dried	Strong.
" 3. Hand-made "glut" pressed in a hand press	Tempered	Mixture of strong and weak.
" 4. Damp-clay machine	Damp	Strong.
" 5. Damp-clay machine	"	"
" 6. Damp-clay machine — repressed in a hand-press	Wet	"
" 7. Dry-clay machine	Dried	Weak and sandy
" 8. " "	"	" " "
" 9. " "	"	" " "
" 10. " "	"	" " "
" 11. Dry-clay machine — repressed by a hand-press	Dampened	" " "
" 12 Same as sample No. 3		

In the above table where there is a mixture of clays the one first named is the predominating one. It is useless for me to give other tests that have been made either in this country or Europe, for no bricks have ever before made so good showing; but that is no reason why they should not. Advancement is necessary in the strength of bricks made for the New York and London markets, as there has been a great decline in this regard for some years past.

Clays that will make good hand-made bricks will always make equally as good stock, if not better when tempered into pug and moulded by machinery. When it is intended to mould the clay into bricks without being tempered, by what are termed dry-clay machines, great caution and discretion should be used both in selecting a machine and also in making the stock.

There is no such thing as dry clay for when all the water, mechanical and chemical, has been driven out of clay, by any means the substance is not clay but something else. The difference between dry-clay machines and damp-clay machines is that the first uses clay that has been dried by the sun or wind, and the other works it in its moist condition, as it comes from the bank.

The nearer clay approaches a plastic condition when moulded into bricks the better will be the stock produced, for when the clay is dried before being moulded it is impossible to produce a strong brick, the particles of clay will not agglutinate under pressure and in the kiln the heat, unless it be of sufficient intensity tomelt the granulated particles of clay and cause them to fuse together, will pass through the brick, and not be so effective as in a damper and denser brick. It will require 25 per cent. more fuel and longer time to burn the dried clay brick than the one made with damp clay. This is a fact that is well known to manufacturers of hand-made bricks, only in a different form. They are only too fully aware that bricks made in the summer, and carried unburned in the shed through the autumn and winter, will be much drier in the spring; but will require a greater quantity of fuel than if they had been burned within a few weeks after making.

For all machines that are intended to make bricks without tempering, the clay should be taken directly from the bank finely pulverized and fed to the moulds in as moist and natural a condition as it is possible to work it. All bricks made by this class of machines will have small cracks on the faces caused by the outer surfaces drying too quickly, and also from the air contained in the clay expanding during burning.

This is not a great drawback to the strength of the bricks for building purposes, unless the cracks are large and extend into the body. When it is intended to use bricks made by any of this class of machines for sewers, culverts, tunnels, wells, or other places where there is an unusual amount of dampness only those that have been thoroughly burned should be allowed, under any circumstances, to go into the work.

For aqueducts, reservoirs, pavements, and all of the above class of work, it is much better to use hard-burned hand-made, or tempered clay machine-made bricks when it is possible to obtain them.

All tempered clay bricks are denser or closer in the interior than on the outer surface, while bricks made from dry clays are just the reverse. In the latter process a slight moisture is developed on the surface under pressure which forms a smooth thin veneering on the faces of the brick, and when this wears away the remainder of the brick soon disintegrates under the influence of frost, dampness, acids and gases.

In selecting brick for building purposes, architects should investigate, to some extent, the methods and processes by which the bricks to be employed are produced. In the desire to get up a showy house—"something that will take, you know"—mistakes are too often made, and which are usually paid for by the loss of health and sometimes by the sacrifice of life. Is it difficult to call to mind houses that people call "unlucky places," in which an unusual number of persons die? These "unlucky places" are for the most part nothing more or less than damp houses, resulting oftentimes from the employment of porous bricks in the construction of the walls. A pile of bricks now presents itself to my mind which were hacked about twelve feet high and placed on an elevation and covered with close, tight roof through which no watter could get to them, but the brick commenced to get wet from the bottom which ascended gradually to the top of the pile, and finally every brick was as wet as if it had been laid in water and soaked.

Bricks absorbing more than eight ounces of water should not be allowed in the foundation or exposed walls of dwellings. A simple way to test the absorption is to wigh the brick and then place it in a bucket of water for five minutes or so; if on removal it weighs more than eight ounces over its first weight, discretion dictates its rejection for the two purposes named. This test applies only to hard-burned bricks, not to salmon stock.

Architects should be aware also of the acoustic effects which dampness of walls has upon public buildings by conducing, to a very great extent, to reverberation which confuses sound.

It is not uncommon for buildings to be hastily constructed and the internal coats of plastering put on one over the other in rapid succession and at once occupied for public purposes. But for many months they fail to give satisfaction to the extent that had been hoped from the pains that had been taken to make them acoustically good; although gradually, as the walls part with their dampness, acoustic defects disappear. It is of great importance that the bricks used in such walls be not so porous as to constantly absorb moisture, and for a long period, or permanently, retard the drying out of the walls or halls, for public speaking or for music. While they may be good in other respects, they may fail in this. In this matter architects owe a duty to themselves no less than to their clients and the public. It is not the province of this article to attempt an explanation of this phenomena which is a matter of common observation.

In newly completed buildings, a little drapery hung up for a few months may often retard reverberation and be a great aid; it can easily be removed when the moisture disappears from the walls and acoustic properties are assured. Since dry structures cannot be built with bricks that are absorbent, and as the extent to which bricks absorb water is so important, it is worth while to give attention to this subject.

"He who builds a noble temple unto art,
And builds it solely from his head and heart
Hath done a sacred service."

Civil engineers should also be careful in accepting bricks to be employed in certain classes of work. Bricks made by certain classes of machines have smooth exteriors but this smoothness is in many instances only a veneering caused by the forcing to the surface the dampness contained in the clay while under pressure in the mould of the brick machine. For instance, take the bricks made from clay formed in this manner and burned to the very hardest state and pave a section of the invert or bottom of a sewer through which pass quantities of sand or gravel and then pave an adjoining section with brick made by machines which thoroughly temper the clay and make a brick smooth and homogeneous throughout its body and which have been burned in the same kiln with the first-named bricks. What will be the result? The first section of the sewer bottom will, in a few months be completely cut out, and the second will stay for many years in almost as good condition as when first laid. Many large and costly works have been greatly injured through the employment of improperly made bricks for sewer inverts.

A case now comes to mind in which a large sewer 20 feet in diameter in Washington, D. C., was built from bricks formed from clay which had not been tempered and the bricks were completely cut out of the center of the invert and thereby let fall a section of more than seven hundred feet on length and causing the utter destruction of that much of the work.

The capacity of buildings of brick construction to resist earthquake shock is an important question in some portions of the United States. During the earthquakes in the vicinity of Charleston, S. C., and which occured in Sept. 1886, more than one-half of the brick houses of that city had their top stories more or less demolished but the houses which escaped the loss of their roofs were in the worst condition, for nearly all of them were cracked a little in front and about on a line with the middle window of the middle story which shows they were all shaken from their foundations and loosened in every joist and joint. The city of Charlestown was founded some two centuries ago. Consequently many of its brick structures were very old; built at a time when the ingredient used to give tenacity to mortar was lime. The weak, adhesive qualities of ordinary mortar could not resist such convulsions of nature as the earthquakes with which Charleston were visited and the walls of houses yielding to the force of the shocks gave way and crumbled.

The modern style of constructing brick buildings insures a large measure of safety. The mortar is compounded with cement which will hold even after the bricks have been broken. This is why with brick edifices three and four stories high, their occupants in San Francisco and other portions of the Pacific coast feel a security against earthquakes that would not otherwise be entertained. The shock must be violent which would wrench their walls or throw them down. During the earthquakes in Charlestown, S. C., and during slight shocks about the same time in California, the writer was an occupant of the Palace Hotel, in San Francisco, Cal., and even in that great hotel which is eight stories in height and of brick construction there were no signs of apprehension among the guests, although under the circumstances, fear might have been pardonable. In the reconstruction of Charlestown cement was freely used. No one in these days should put up a large brick building without the mortar being composed of at least one-third cement.

ORNAMENTAL BRICKS.

When a person builds a dwelling for his own use he makes an exact picture of his taste and exhibits the degree of his refinement and cultivation whether the structure be costly or not the same as he does in his dress and personal appearance, for plain people build, dress and live plainly and as we have had a majority of this kind in the days gone by, we now possess their pictures in the plain, unassuming buildings which survive them. But that period is now rapidly passing away and attractive designs in architectural constructions are to be seen on all sides, in suburb and country as well as in towns and cities, and now we are in many instances combining elegance of appearance with solidity of construction.

It is not at all necessary to make a house expensive in order to make it attractive for some of the most costly structures are the least so. Pleasing ornamentations in burned clay can now be purchased so cheaply that a person who builds of brick without them generally does so from lack of all desire for these embellishments of the exterior of his home.

The ornamental bricks now largely used are usually made from tempered clay and are moulded and pressed by hand, great care being observed to have the clay free from stones and small gravel and also in the handling, rubbing or sanding and drying of green bricks, for if the drying be done too rapidly they will have small cracks over their surface which are great objections in the eyes of buyers. In the kiln the bricks are carried along gently at first in the burning or firing in order not to "crush" or "squeeze" them, as they become soft while the steam or "water-smoke" is being driven off.

BLUE BRICKS.

Blue bricks is the name given to a material which for some purposes has no equal, being for some requirements much superior to the best quality of stone. In England and in many parts of the Netherlands, it is most highly esteemed for road and stable pavements, copings, channel courses and for solid walls, especially hydraulic constructons.

The bricks resemble cast-iron for hardness but are much superior to it for durability, being incapable of being eaten away by oxidizing. Clays which contain the greatest number of elements that are sluble in chlorhydric acid are the best for the production of these bricks and for terra-metallic ware in general. Natural clay containing oxide of iron in abundance and sometimes highly impregnated with lime and which is consequently much more fusible than ordinary brick clay is the material mostly used.

In Staffordshire, the clay used is a ferruginous material which is easily fused at a china-biscuit heat.

When natural materials properly combined are not possible to get, iron and lime in the shape of slag ground are usually mixed with fat clay, fine coke dust, and mill cinder, are used in England. Pugging as well as the moulding of this class of brick must be done by machinery. The most economical as well as effective kilns for the burning of this kind of bricks and for all classes of terra-metallic ware are those constructed on the annular system, as the firing is to a high vitrifying temperature and the cost of fuel is amost expensive item unless kilns on the continuous plan are employed. The blue color does not impregnate the whole body of the Staffordshire brick, as for terra-metallic ware, but penetrates only to about one-eighth of an inch from the surface.

The color is obtained by continually submitting the stock or ware when at a high degree of heat to a reducing atmosphere of smoke, thereby converting the red peroxide of iron into protoxide; sulphur greatly assists the process. The salts of the protoxide of iron are all bluish and greenish. The same clay or material may be made to yield a red brick, a blue brick or glaze, which is dependent wholly upon the manner and degree of firing. The Cumberland and other soft coals commonly used in this country for burning ordinary building bricks will not answer for this purpose as they are too hard to manage, as the successive very heavy charges of fuel which are permitted to burn quite low.

The quality which our Cumberland and all soft coals have of swelling or largely increasing in bulk after being fired heavily, makes this class of fuel still more undesirable for this kind of burning and besides it is too quick and has too much flash. Wood and clean peat are the best agents for meeting the requirements of blue brick and terra-metallic ware burning. It is impossible to burn this class of pottery in rough, open kilns without excessive cost for fuel as well as loss on melted and salmon stock.

Written for the Clay-Worker.

HINTS ON BRICKMAKING.

No. 37.

BY "R. BRICK."

The question is often asked: "Which is the most economical plan to build a brick plant?" After the location has been determined then comes the question as to the best season of the year to begin operations. Early spring is certainly the proper time; this gives the whole season for natural drying. In speaking of a brick plant a permanent one is meant, that is, steam power, artificial dryers, and permanent kilns. First, select your machinery and engine and boiler, and order them. Then grade your yard with a fall of one foot in one hundred. Provide drains so that surface water will be carried away quickly. Order all lumber necessary to build a good engine room, machine building and tool house—these buildings should be made permanent from the outset. Begin making bricks as soon as there is no probability of frost destroying the bricks, and dry by sun heat and air. Provisions must be made to protect the product so far as possible from rain. If some of the bricks are somewhat damaged by rain they can be burned and utilized in building your permanent walls as well as the temporary ones. The product of the first season must be burned in temporary walls. There will be a certain per cent. of arch brick damaged more or less and probably more salmon brick than can be sold, these can be set aside for building the permanent kilns, and dryers. Bricks cannot be burned in temporary walls or even permanent walls without more or less damage to the arch brick, unless the latter have furnaces attached to protect the brick from sudden shrinkage from drafts of cold air when firing. No man, however skillful, can prevent cold air from rushing in the fire hole when he is putting in fuel, this I think is plain to every practical burner as well as others. By setting aside the damaged and part of the salmon brick, you are enabled to give your patrons a good quality from the start, thus securing their custom. Salmon brick should always be protected from rains to save them. As soon as a sufficient quantity of brick has accumulated begin the building of clamps, and in the latter part of the season begin building artificial dryers of whatever kind you may choose, from among the many in use; by the time cold weather comes have the dryer ready for operation. During the fall and winter build as many additional clamps as may be needed, and by the time spring opens your plant is completed and ready to turn out good brick, with the full capacity of your works every day. This is not only the most economical way but enables one to put in a plant in this way with much less capital.

I have known men to buy brick to build their dryers and clamps, this think an extravagant way to proceed. If the brick used are manufactured at the plant they get them at first cost, if they are bought they must pay cost with profit added.

Next to labor fuel is by far the most important item in brick manufacture, and this question should receive careful attention. Before the work of building the plant begins determine whether the fuel used will be coal, wood, oil or gas, and the cost of same delivered at the works; if it is coal, contract for the year's supply at the most favorable time; if wood is to be the fuel be sure to have a season's supply where it can be reached with certainty when wanted. Judgment should be exercised in purchasing wood, good solid split wood is cheaper at $3.00 per cord than is poles, soft or decayed wood at $2.00 per cord. The same in a manner is true of coal, it is better to pay more and get clean, pure coal, for we must remember that there is no heating power in ashes and cinders, and impure coal requires more labor to fire with it, and more heat is wasted, as the furnaces require more frequent cleaning and this is always attended with a certain loss of heat There is no doubt that the very best way to economize heat and fuel in burning is to hold the heat on the ware as hot as it will bear, and without intermission. This not only economizes heat but improves the quality of the ware burned.

HOW TO GET ON.

We have little sympathy with the spirit of the complaint that is abroad in the land, as to capital oppressing labor. That those who are employed are justified in the use of extreme measures in resisting the exactions of the employer. It is high time to talk plainly of the relations that exist between the two. The employer is entitled to the service for which he contracts. The employed is entitled to the compensation promised. The man or boy that agrees to work a given number of hours per day or to work the usual number of hours which the custom of the neighborhood has established, should render a faithful service. A faithful service implies not only a service of body but also of the mind. The employment of the mind as well as the body means not only to do what the body can do without too much fatigue, but to do it well. The service of some men is worth almost double that of others, for the reason that they study to do what they do well, both as to the character of the work done and the economy of time in doing it.

To illustrate more particularly: In the handling of clay at the bank, it is often desirable that the stratas be thoroughly mixed, the man that will give faithful attention to this feature of the work and at the same time expedite the labor of handling may save to his employer in the betterment of the character of the product turned out, several dollars per day, compared with a man who only handles the clay to draw his wages. Or in the handling of green brick one may so carefully and yet rapidly handle them so as to preserve the edges and corners to an extent that his services is of much more value than in the case of another who takes no pains but rather mars and injures the appearance by rough and careless handling. The same is true to some extent in everything that is done about the yards.

The man who studies the interest of the employer renders the more valuable service.

The "don't care" or "if he don't like what I do I will quit" man, is only a time server. Invariably such men keep their eye on the "boss" and steal time when they can, or otherwise injure their employers, in petty ways it may be, but no less effectually. Such men breed disturbance among the men on the yards, complain of oppression, and in many ways annoy. There is little hope for the success of such men. They never get on to success in life. They don't care, they don't do, and won't do for the interest of others.

On the employer's side it is clearly to his interest not to overtax the strength of those whom he employs, encourage them to a faithful service, study their interests as well as his own, by giving them regular employment if he can, by saving them any extra labor or unnecessary delays, or other annoyances, and pay them the wages as agreed upon. And promptly discharge all disturbing elements as soon as their places can be filled with better men.

We have, however, a special interest in those among the employed who have a desire to make a commendable success of life. The men or boys who study the interests of their employers, who strive to do what they do, well. For such there is a promise of success. To such we say, continue in this well doing, husband your earnings, by laying them by for future use. Determine to have a business of your own at some future day. Make your services so valuable that your employer will prize them so highly that he will pay you the highest wages for the service done or advance you to positions of greater responsibility and better wages. The faithful man or boy will be found out and advanced sooner or later. Such service cannot be hid away for a great while. The keen business eye is looking out for such. There are thousands of men to-day who are proprietors of a large business, who at one time were off-bearers, receiving daily wages and low wages at that. They did well, biding their time until they were advanced. They were not lost. Such service is never lost.

We advise those who want to "get on in the world" that in addition to faithful service, that of reading when they have a leisure moment, the experience of others, or the thoughts of others, will be a great help to "get on." Read publications devoted to the same line of business. Take such publications in your own name read them carefully, and mark all important suggestions and experiences, and file them away for future reference. It will be far better to do this than to read "dime novels," or to spend the time in telling filthy stories. Those who will follow these suggestions will "get on." There is a bow of promise to the man or boy who does faithful work, studies the interests of his employer and then when he has a leisure moment, turns aside to some quiet place and spends the time in storing his mind with knowledge for future use. There is no such thing as setting any reasonable bounds beyond which they may not go, in business life.

We have thought, and here we will drop the hint to the proprietor, that it would pay to select such men or boys in their employ, as they might think would appreciate the gift, pay for and send them a live publication devoted to the business. Have such publication mailed to them in their own names. Say to them; you have been faithful and there is a promise for you if you will make yourself intelligent in your business. Who can tell, but what very many in this way could be encouraged to attain distinguishing success in life. They will feel themselves called to a higher and better service for their employer—a service of mind as well as body.

It is well to make money in conducting a business; it is better to make more money by helping others up to an intelligent consideration of your and their interests. Withal, is it not one of the "hows to get on" both for the employer and the employed?

MY FRIENDS.

BY PROF.

Oh mud dauber, tis of thee
Making things of utility
Of thee I'm proud.
Long may the craft unite,
Ceasing each others backs to bite,
And read the Clay-Worker now all right,
Making old fogies' shroud.

Clay banks where our fathers delved
Dry kilns where their brick they shelved,
Matlocks and picks all newly helved,
Good work to do.
To-day no longer need we swear
And curse and burn our hair,
As the fire comes out where
The smoke is blue.

CORRESPONDENCE.

These columns are open to all. The full name and address is required but will not be published except when permission is given by correspondent. Those desiring to communicate privately with any correspondent whose full name is not given can do so by addressing letters care of Clay-Worker.

Philadelphia News.

Editor Clay-Worker:

So far this year, 4701 two-story houses have either been built or started in this city against 3222 up to same time last year. Of three-story dwellings 1463 have been started or built against 1080 last year. This makes 6185 two and three-story houses for the first six months against 4302 to same date last year. This beats all the years we have ever had. A great many are asking what will be done with all the houses. Permits are being taken out as though the demand were extremely urgent. Real estate is to be had at reasonable prices. Investors consider that house building is the best and safest investment that can be found. The investments range from 8 to 15 per cent. Taxes are $1.85 on $100. Our manufacturers are all prosperous. The textile interests are the most important, employing over 100,000 persons. It is this activity in the industries and prosperity of the wage-workers that makes it possible to build and sell so many houses. It will be remembered that an old millionaire, Isaih V. Williamson, who died a short time ago, left several of his millions for the establishment of a trade school. A board to spend this money was appointed and have not been able to agree upon the plans of the architects submitted. They have agreed to employ one architect and amend his plans to suit themselves.

Our brickmakers never had such a busy time before. Their contracts will keep their men busy at work as long as the weather permits. Preparations are being made to start three or four yards a little farther from the city. The brick makers will have a grand time when some of the schemes under consideration start. The Pennsylvania R. R. Co. will be a large buyer of brick to run up its additional buildings on Market Street. The Reading R. R. Co. expects to have its ordinance passed next fall to build its terminal line to 12th and Market Streets. Brick will be wanted by the millions then. There are two or three schemes on hand to build tunnel and elevated roads but these are bitterly opposed. Our belt line will go through all right; it is to be eighteen miles long. The people who live by investing their money have just been paid over $100,000,000 in Boston, New York and Philadelphia within the last three days. During the past six months there were 656 failures in this city against 585 for the first six months last year. The liabilities were $5,000,000 as against $4,000,000 last year. Our builders, architects, brickmakers, lumber manufacturers and dealers are all hoping that the good times we are having will continue. They would like to see a little more margin in business, but those good old days are gone forever. If we want to make money we must join the Sugar Trust.

The advance in labor-saving machinery for the making of brick has been greater for the past few years than all the improvements put together for the moulding of brick since the days when "David the primitive brickmaker made the children of Ammon pass through the kiln." Many of the machines are marvels of wonder turning out as they do, as much as 80,000 perfect bricks per day. A great number of machines have been patented in this country and in Europe, but it has been found exceedingly difficult to render them successful for the purposes for which they are intended and while there are continually patents being taken out for what it is termed "bearable plans," it is but fair to say that the perfect plan for moulding and turning out a complete brick in all its parts, has not yet been found.

Considerable comment is being made in reference to the action of the Government for purchasing 550,00 enameled bricks from English sources for use in the construction of the Congressional Library Building at Washington, D. C. It is said that Gen. Casey bought the bricks because they were the cheapest and best. He said that he had advertised extensively for bids for these bricks and that not a single American manufacturer had put in a proposal. He also claims that the Philadelphia brick were inferior in quality to those of English make. This is not the fact as we have the best foundation clay right here in Philadelphia, for the making of the best glazed or building brick.

The Excelsior Brick Company have the contract for supplying the Public Buildings in this city and the brick will compare with anything of the kind made in the known world.

As a matter of fact, Mother Earth has supplied this country with clays suitable for all building purposes equal to that of any other country on the globe and American genius has supplied the brains for the building of brick machines that will turn out better work and more of it than England or all other countries combined. Then why should Gen. Casey go to England for brick? Eh? ANON.

The Village Brickyard.

Editor Clay-Worker:

Nearly thirty years ago the writer, raised in a country town, left school to learn an ideal business as a farmer and in doing so, took leave of one of the most bookish men in the state, who wrote me:

> "If plough you will,
> Be sure you plough your own furrows."

I went to live with an old man who owned a "model farm," one that had taken several premiums at the State and County Agricultural Fairs. The farm was high, rolling land from which we could overlook some seventy odd homesteads and I well remember being reminded, "Here, my boy, look out and see when the neighbors are plowing, planting or harvesting and don't let us be more than a day ahead or behind them in our work, for you may depend upon it their work is regulated by the combined average experience of the community, and if we follow them we shall not go far astray." Both of these admonitions my experience has repeatedly shown are applicable to every walk in life and to none more so than the business of making brick. Hence following out this plan, I will now turn another furrow, and not because I know all about the matter, but because I know a little and I want to chip in my little, in hopes some brother craftsman may hereby be encouraged to do better, so that, like my model farmer, we can read in the Clay-Worker an average of our experience and the steps leading thereto.

Some few years ago my attention was called to the subject of enamelling brick and the possibility of reaching a satisfactory result in our ordinary open-top Philadelphia kilns. I am aware this is one of the trade secrets like burning brick that the people who know do not and will not talk about, but then I am not in the business of selling recipes or instructions and, moreover, look very much sideways, sort of cross-eyed, at trade secrets, as I have found they are mostly claimed as proprietary by very small men or poor workmen who lack every essential for business success. One of my old masters, for a consideration, showed me the whole secret of dovetailing and fitting together on an old fashioned dough trough, and I shall never forget his look of surprise that I should be able to draw and calculate the whole thing from a sketch then recently published in a mechanical paper. And so it is in all such matters; every man who earnestly sets himself to solve the mysteries of a craft will eventually find out all the processes, and I take it, that a business like ours does not necessarily have any trade secrets and the more we can spread our methods among each other, the sooner we will qualify each other for better results.

Looking through various works on chemistry and sundry trade journals, a number of recipes were selected which the writers professed would glaze or enamel pottery. Then the wholesale chemist was approached and a bill of chemicals to meet the ingredients named procured at a cost of about $4.00. Test pieces of clay of fine quality 1-in.x2-in.x 1½-in. were made and before burning engraved two or more with the same number and then fired in the center of the kiln, no sand being used on the outside of any of them (and by the way, this is a very convenient size for test pieces of various clays which every brick burner would do well to have a cabinet of for comparison.) My first trial was almost a complete failure. I ground and compounded my various recipes and brushed or painted my test pieces and having dried them set said pieces among the interstices of the brick about the middle of the kiln. After due time the kiln was burned off, the samples taken out and every one of them found coated with sand and ashes; half of them this foreign matter would brush of and underneath was my white glaze dried like whitewash and off it scaled at the slightest touch, but other samples the heat had been sufficient to make the ingredients soft and there was my glaze, sand and ashes all solid and fast to the surface of the test.

It was plain from this lesson that I might take hope but lacked a good deal from success. Casting about it was evident I needed a sagger to shut up my ware from this foreign matter. Not having such an article in the vicinity, I bought an old butter pot with a close fitting lid and taking only such recipes as had given me encouragement in the first effort I repeated the compounding, set my pot in the center of the kiln and in due course out it came, but unfortunately, I had leveled the inside of the pot with fine sand. Unfortunately, the brick surrounding the pot shrunk in burning, throwing too much weight on the pot and cracking it open; unfortunately the pot had been glazed and everything in it was also glazed all over from absorption and the sand I had leveled with getting hot had been put in motion and settled over all my work. Still there was decided evidence that I was on the way, part of my work was fair and there was no want of sufficient heat.

Following this I secured an unglazed earthen vessel, again prepared my compound, brushed my samples and put them through the kiln. This time the work which would melt in our fire came out all right—several of the glazes desirable—and the door half open for other knowledge only waiting to be properly questioned. THE VILLAGE BRICKMAKER.

[To be continued.]

Brickmaking at Buffalo, New York.

Editor Clay-Worker:

Having but a few hours to spare, I thought of no better way of improving the time than to visit some of the brick yards here. When you have seen one of them you have seen all, so far as methods and manner of making brick and the kind of clay is concerned. And when you want to buy a thousand brick you go to the same office and buy of the same man, (Mr. Brush), no matter whose make of brick you want.

Most all the brick are made in the eastern part of the city on the Martin machines. The rack system is in universal use for drying. Most all the yards use permanent clamp walls for burning, with various furnace attachments. The old Bingham and Wingard being the most common.

The burns are good average burns as compared with other cities.

Most all the yards mix about one bushel of finely ground slack coal per thousand brick with the clay when it is put in the soak pit.

I saw no clay crushers in use. Each machine is provided with two soak pits, one on each side of a conveyor. Each pit holds enough for one day's run.

The clay is put into one pit today and used tomorrow. The ground coal is mixed with the clay as it is dumped in, by filling the pit, say with two feet of clay, leveling it, then a layer of fine coal, then two feet more clay, and so on.

The clay is carried to the machine by means of a conveyor made with two strands of wire rope connected about every four feet crossbars of iron bar scrapers. The lower part of the conveyor works in a flat bottom trough and drags the clay to the top of the machine. I think this one of the best conveyors I have ever seen for taking clay from a soak pit. It is cheap and durable.

One thing, however, at all the yards here I found the conveyor about two feet higher than the top of the clay in the pit, so that the man standing in the pit had to lift the clay at least shoulder high to get it into the conveyor. This seemed to me very bad. I think the conveyors could be lowered between the pits, so that the shoveler could handle the clay with about one-half the labor.

I examined the crusher used for crushing the coal and found it to be a set of rolls about 18 inches in diameter and two feet long set under a large iron hopper. On the face of the rolls were V shaped projections, very wide at the top, and raised about one-eighth of an inch from the face of the rolls. These projections made the face of the roll rough and caused the coal to feed well.

Now, a word as to the Brickmakers' Association here in Buffalo. As remarked above, all the bricks are sold from the same office and by the same man, (Mr. Brush). I spent some two or three hours with Mr. Brush riding from yard to yard. And it was quite a novel thing, I assure you, to hear him giving orders at each yard as to the number and kind of brick, as well as the job to which they were to haul for the day.

A number of yards were ordered to haul to the same building while others were ordered to haul sewer brick, still others soft brick, and so on. The entire output of all the yards, save one, was controlled by one man through an executive committee.

I think this an excellent plan.

CORNING, N. Y.

The great calamity at Johnstown has attracted the attention of all so much that I do not suppose you readers care to hear of our small losses. The fact is, however, that our city has suffered severely. Many of our houses are washed away and even the land on which they stood.

The Corning Brick Works situated in the lower end of the city suffered severely. Their loss being not less than $10,000.

They had just put in almost a new plant, consisting of the Penfield stiff mud machine, pug mills, crushers, etc., the Iron Clad Dryer, and were almost ready to begin a plant of the Eudaly down draft kilns. They have a good demand for brick, even more than they were able to supply before the destruction of their works.

In the course of a month they will be in running order and as soon as they get their new kilns will be able to furnish a very fine quality of front and ornamental bricks. OBSERVER.

Reply to F. L. S.

Editor Clay-Worker:

A writer in June Clay Worker over the initials "F. L. S.," at Helena, Mont., refers to my article in your May No. and quotes me saying: "If clay will not stand sun drying, it will not, as a rule, stand sufficient heat in burning, to make a good brick." And then wants me to tell him, if I mean that such clay cannot be dried by steam or other heat in a "Dryer" without cracking. If "F. L. S." will notice, he will see that I said "cracking" might be prevented by sifting dry sand or dust over brick as they were laid out on "yard floor," or, that if put on pallets under sheds, cracking would be prevented. If "F. L. S." will read my articles as they come out, he will see a good answer to his question. He says his clay does well in a room, and would like to know if it will do so in a "Dryer." The class of clay he alludes to, will crack anywhere in a dry, hot air, he will find the reason in my fourth article. But I will say here, that if "F. L. S." will fill a "Dryer" with his brick, made of soft mud, then turn in steam from the boiler, until the brick became hot as steam, then let the steam out, and no more in, but turn on dry air, or hot air not over 212° Fahr., his brick will quickly dry without cracking, and with careful burning will make a very good brick. Now if "F.L.S." cannot see the reason of this, (for I never say or do anything without a good reason), he will find it convincingly given in my seventh article, mean-while he can take my word, and go on with a "Dryer," as I have indicated, or he can mold his brick of "steam hot" mud, and dry them anywhere he may choose, if the heat is no hotter than the mud.

J. W. CRARY, SR.

That Election Hat.

Editor Clay-Worker:

I have been anxiously waiting to hear from our terra cotta brother, relative to the charges of "A. C. Member," (which I presume if properly translated means a charter member) in "Convention Brickdust, No. 3," page 236, April No., regarding that hat transaction at Memphis. I waited confidently, reliant and sure that he would promptly refute, explain or talk around the charge, but my waiting has been in vain and the charge remains unanswered. What can it mean? Was Pickett a prophet and has our brother sought the gate of St. Peter? Is he still there "busy with his smile?" Or has the hat of "Charter Member" dropped down over him as an extinguisher and snuffed him out? I do not know, and regarding whatever I do not know, I generally ask "Clay-Worker," and so I ask you now regarding his fate. I am sure something terrible has befallen him. His pure and lofty vocation had never seared his conscience so as to make him keep still under such a charge. No, something has happened. What is it and who is to blame? I must say that I consider "Charter Member" somewhat to blame in so recklessly putting temptation in the way of our young brother in the shape of that "Election Relic," that bandage, (so to speak) with which he had bound together the surging thoughts that burned and pulsated beneath it when he wore it. When "Charter Member" recklessly put this in the way of this young man what could be the result when he put it upon his artificially enlarged head? How it would start the tide of his thoughts in a flood of new schemes—"New Kilns," "Driers," "Machines,""Burning with Putty," and no end of strange schemes. This not for a day only but the poor man has to go through

this for a whole year, for you remember "Charter Member" has solved the heretofore unknown question of when our brother changed hats and in fact ruins the young man's chances at the next convention. I must censure "Charter Member" on one point, that is, on bringing sectional strife and the bitterness of politics into this matter. He says they were both election hats but dates his at the last election and dates our brother's back four years. This is a sad question. Such a wide difference is exposed by this statement that anyone is forced to expect some new expedient from the man who won a hat four years ago and it seems hard enough when our young brother had to adopt another method to have him exposed and carry the exposure "way back." I am glad to note one point, which impresses me favorably as to our young brother's integrity, and I note it gladly and triumphantly. I shall emphatically ask, on behalf of him who has disappeared, whether "Charter Member" had his card in his hat. I have noted through a long and eventful life that men who are accustomed to exchange back-number hats for late election trophies, do not as a rule, insert their cards in the relics they leave, and, in this respect, I think "Charter Member's" story is inconsistent and it brings me to fear (coupled with the young brother's disappearance), that the "election trophy" which "Charter Member" left, though young in years, was old and dizzy with experience, and has run its wearer no one knows where and into no one knows what.
FAIR PLAY.

The Chicago Affair.

Editor Clay-Worker:

In response to your request for information as to our so called strike I will first say that it is not a strike nor a lockout, but so far as effect is concerned the result is the same.

The spring dress the wife expected will not come. The purchase of the carpet for the "best room" floor will be deferred. But these items are merely luxuries; with some it will be less flour, less meat, and with others it will be no flour and no meat. On whom does the brunt of it fall? The wife and children. To whom and to what will you attribute the cause? "Aye, there's the rub."

In 1886 the Chicago brickmakers compromised on eight hours work and nine hours pay. The country yards, namely, Purington-Kimbell Brick Co., Wahl Bros., and Adam Weckler, at Blue Island, May-Purington, at Dalton, Ill., on the C. & E. I. R. R., and Pullman Brick Co., at Pullman, were working satisfactorily under ten hours work and ten hours pay. The men were contented and at the Purington-Kimbell yard had entered into an agreement whereby they were to receive a certain sum per day from April 15th to October 15th and a lesser sum from October 15th to April 15th.

Points covering all anticipated causes for dissatisfaction were incorporated in the contract, revised by a committee of the men, and the officers of the Company, signed by both parties to the agreement, and then ratified by *all* the men as a body.

This apparently was a solution of the strike problem. Could mortal man do more? The employer placing his employes in the same relative position as business men do each other when they are about to consummate a trade.

The advantages and disadvantages are discussed and agreed upon. The deal proceeds and each is desirous of carrying out the contract.

An unlooked for objector appears upon the scene. The city men hear of this Arcadia and they long to bring it under their power. They want nothing themselves. They work eight hours and have plenty of time for sleep and recreation. Then what is it they *do* want? Only one thing is apparent, and that is to keep the pot of "Labor" boiling. In doing this there is need for organization.

Organization needs officers and officers need pay.

When will men learn that under such circumstances as these, in obeying the behests of men who derive their living from "agitation" that they are but stokers in the hold of the ship, the propeller and the motive force—down under water, or in the hold working for dear life, "unhonored and unsung," while the officers are on the bridge, or deck, taking all the honors and getting all the pay.

A number of men from the city, accompanied by their leaders went to the yards above mentioned (with exception of Pullman) and forced the men to quit work.

With their wind pumps of brag, they are now forcing air down their throats instead of bread. The pay rolls show for a loss of $600 per week to the manufacturers, the men lose $6,000.

How long it will last on this basis can readily be surmised.

Already between 80 and 90 of Purington-Kimbell's men have returned to work of their own accord. The other yards agree to remain idle until the 5th of July.

The whole trouble arose on account of Mr. D. V. Purington refusing to allow a committee from the different assemblies of the Knights of Labor to dictate any terms, or interfere in any way between his employes and himself. He insists that any number of American citizens have the right and should be competent to arrange their own affairs without the interference of outside parties, not excepting the chief officers of a labor organization. In fact a member of the striker's committee admitted that if all employers and employes sustained the same relation to each other as the P.-K. B. Co. and their men there would be no further need of their services.

The men did not want to go out, and have never expressed a grievance. Those who returned to work *asked* to be taken back and their relations are the same now as they were before the strike.

Mr. Purington insisted that all differences between his men and himself had to be adjusted by parties concerned and assured his men, returning on the agreement, that they would be retained under all circumstances so long as they did their duty.

No man has ever been refused employment because he belonged to a labor organization at these yards and no man will be discharged should he refuse to join one.

From every indication the men at all the yards will be at work on Monday next and thus right will triumph over might, and all has been accomplished without bodily harm to a single man.

There is one inexplicable feature connected with the difficulty, and that is, the men who were working "piece work" were the "cat's paw" for the outsiders who wanted eight hours a day's work with ten hours pay.
SIC VITA.

Chicago, Ill., July 5th.

A New Departure.

Editor Clay-Worker:

While in River Falls, Wis., recently, I visited the works of the River Falls Brick Company and noticed a new departure in brickmaking which I think will be of interest to some of your readers. It is simply a dry house for the drying of clay in bulk. The clay is taken out of the clay bank which is filled with water and difficult to drain. The clay is loaded on the car and is run through the dry house of the Iron Clad Patent built by Messrs. I. & M. Wolff and Coleman, of Chicago. This dry house is 78 feet long by 22 feet wide and holds 42 dump cars of a special pattern. Each car holds sufficient clay for about 1,000 bricks and the clay is dried in twelve hours sufficiently to be worked in the Chambers Machine. During last winter the owners of this yard found it impossible to get their clay in shape for the machine and resorted to this means for preparing their clay. The dryer is simple and does the work very effectively and there are undoubtedly a number of your readers who may profit by an arrangement of this kind. The modification of this plant might be utilized for preparing the clay for dry pressed machines on a simpler and more economical basis than that usually resorted to by having clay drying sheds. I would suggest that parties interested in this matter correspond with the River Falls (Wis.) Brick Co.
A PILGRIM.

PROGRESSIVE (?) BRICKMAKERS.

J. W. Henry, a brick manufacturer of Tipton, Ind., visited our state capital recently for the purpose of challenging the Indianapolis brickmakers to play a game of base ball with the Tipton brethren, the game to be played on Sunday and for any amount to be agreed upon. The clubs to be composed of men actually employed on a brick yard.

With characteristic enterprise we will send our "special representative" to edit the great event.

FIBROUS BRICKS.

A New Composition of Matter.

United States Letters Patent was granted on June 11th to Charles Carroll Gilman for "Fibrous Bricks" and their making.

This invention is the fifth and latest of his family of "Porous Earthenwares" and affords an improvement over the others which is likely to elevate the art to a work of *Joinery* as well as of Masonry and Carpentry, which it now enjoys.

The difference is the mode of its manufacture, from that of the fire-proofing and building compositions, which precede it in the order of invention, lies in the distribution of Asbestos Wool (not to be confounded with mineral wool), in fixed quantities throughout the mixture of combined earthy and vegetable ingredients, before going to the press.

By reason of the friction engendered in passing through the die, which shapes the plastic compositions, the Asbestos fibre becomes straightened into lines running lengthwise of the blocks, and remains in this strained form during the drying and burning processes which follow. Being indestructible by heat or fire it continues also as a fibre in the burned wares affording a strength to resist tension, not possessed by them without something added, on the principle exhibited in the admixture of hair in lime mortars, and allowing an application in architecture not before dreamed of, as for instance the construction of base-boards, doors and window frames, mouldings, and even doors and shutters, for the wares can be worked with edged tools, subsequent to firing, with the same facility as wood.

The first of Gilman's Fire-proofing Compositions, it may be remembered, was his invention in 1881, commercially known since that time as "Terra Cotta Lumber," a trade mark, which has given the art, founded upon that beginning, a world wide celebrity by stamping itself into the corporate name of manufacturers from Maine to Oregon, and across the seas even to far off Australia.

This first invention consisted of kaolinic clays and resinous sawdust mixed with water and ground together in such proportions and to such a degree of homogeniety as to permit the bricken product after pressing, drying and burning, to be shaped with the same tools used in carpentry, so evenly porous or cellular had the product become, by the skillful incorporation of the perishable matters with the clay when plastic and the utter elimination of the sawdust by finally firing in kilns, as bricks are fired.

The practical manufacture upon a large scale, and the introduction of the Fire-proofing upon the market, showed conclusively, however, that owing to the infrequency of fire-clay deposits, and the consequent expensive transportation of the raw material, or burned products, such improvements in the manufacture would have to be made, as would permit the substitution of common or surface clays, in the place of the scarcer and fictile varieties, before the wares could become a staple to the world at large.

Labored experiments in this direction finally developed several new discoveries, which have since proven of even greater value than the one above described, and each of which was successively patented by Mr. Gilman both in this country and the older clay working countries of Europe.

Mixtures of earthy and vegetable matters were so treated that the wares could be burned without other fuel than that supplied by the atmosphere and the combustible ingredients contained in the compound, and, too, in so short a time in some instances as twelve hours.

Safe drying processes were invented of less than twenty-four hours duration, and permitted the production of wares as long as ten feet, of proportionate dimensions in other directions without warping or cracking.

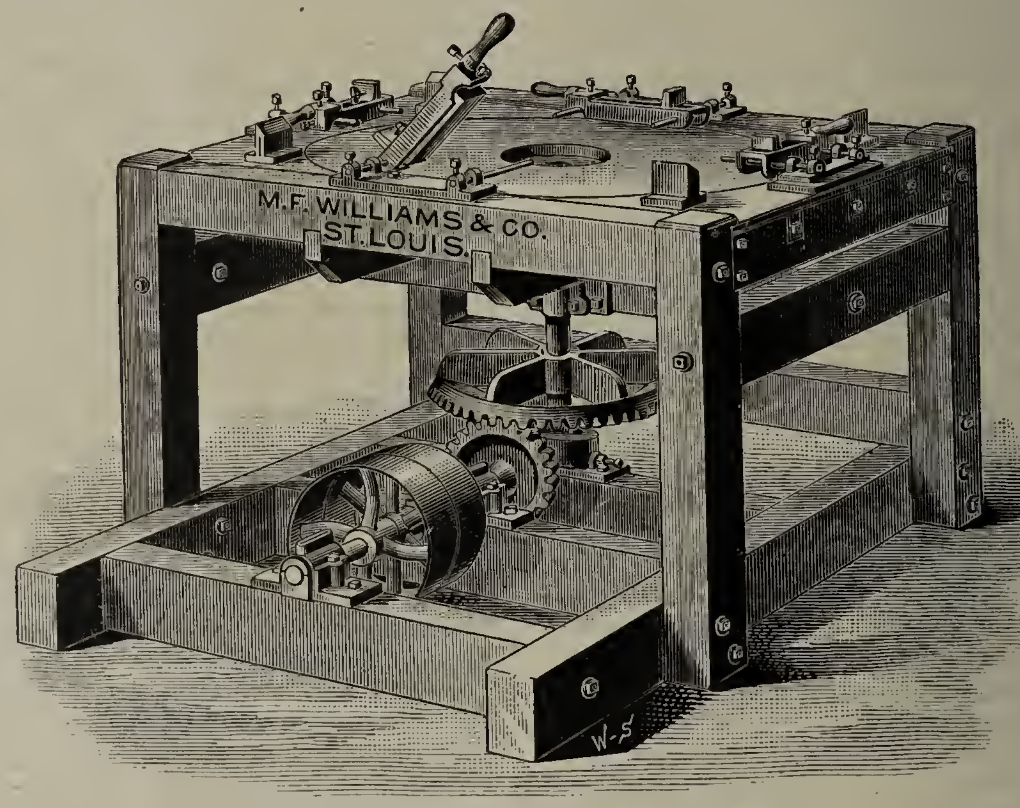
The weight of the burned product was cut down from sixty-five pounds to the cubic foot to forty, and its cost from seven dollars per ton and upward to three or three and a half dollar, while at the same time, the cost of plants was reduced from $30,000 to $12,500.

This great reduction of cost, both of plant and product converted a material originally used solely for fire-proofing purposes, into a building material for general use, while at the same time retaining all of the fire-proof qualities of the first invention, so that for cheap cottages, stores and outhouses it is fairly competing with brick and pine lumber over which it possesses such inestimable advantages.

These facts should awaken the attention of our drain tile manufacturers, who are suffering from competition and consequent overproduction.

We are advised that a pony plant of 20 tons daily capacity can be supplied to tilemakers, who have a motive power of 40 horses or even less, at a cost inside of one thousand dollars.

Why not make your lumber at home, a fire-proof lumber at that, and build farmer's houses and barns instead of waiting for them to tile their wet grounds? is a question which may well concern the class of manufacturers of whom we have here made mention.


M.F. WILLIAMS & CO.
ST. LOUIS.
W-5

WILLIAMS' SIZING MACHINE,

For Press Brickmakers.

The above cut represents WILLIAMS' SIZING MACHINE for shaping Brick that cannot be shaped upon the Dry Press, such as ARCH BRICK, TRIANGULAR BRICK, and Brick for OBTUSE and ACUTE ANGLES. This Machine is operated by 4 boys; the grinding medium being sand and water, which is fed onto the wheel through a sluice-box not shown. The clamps will accommodate any shape desired. The bottom of clamp being hinged, and is adjustable to any shape, putting in and taking out of the brick requires but a moment—only one thumb-screw to operate. The clamps, guides and rests are all adjustable and very simple and durable. The upright shaft is adjusted by the tallow pot below, which keeps the wheels always in tram. The wheels are made thick enough to admit of refacing at least six to ten times, which should be done every season in order to insure even work.

For prices and further information, inquire of the sole Manufacturers,

Milton F. Williams & Co.,
1417 & 1419 N. Second St., St. Louis, Mo.

STOP IN YOUR MAD HASTE FOR WEALTH AND READ ABOUT THE EIGHTH GREAT WONDER OF THE WORLD.

Since the cessation of political strife, industry and trade have taken prodigious strides ne'er known before. America has assumed the foremost position among the nations of the Earth and Kings do her reverence. What has caused this extraordinary change in material things? The Sages and Wise Men of Oriental History move in their sepulchers and the answer comes rolling back to us on the sands of time. It is thus:

"This great revolution in America's growth arose from the introduction of two new sizes of the OHIO BRICK AND TILE MACHINES."

It is not strange that the minds of the people turn with glad relief from the contemplation of political issues to behold the wonders of these mighty Machines which grapple with the Earth while towering buildings and fertile fields mark their appearance.

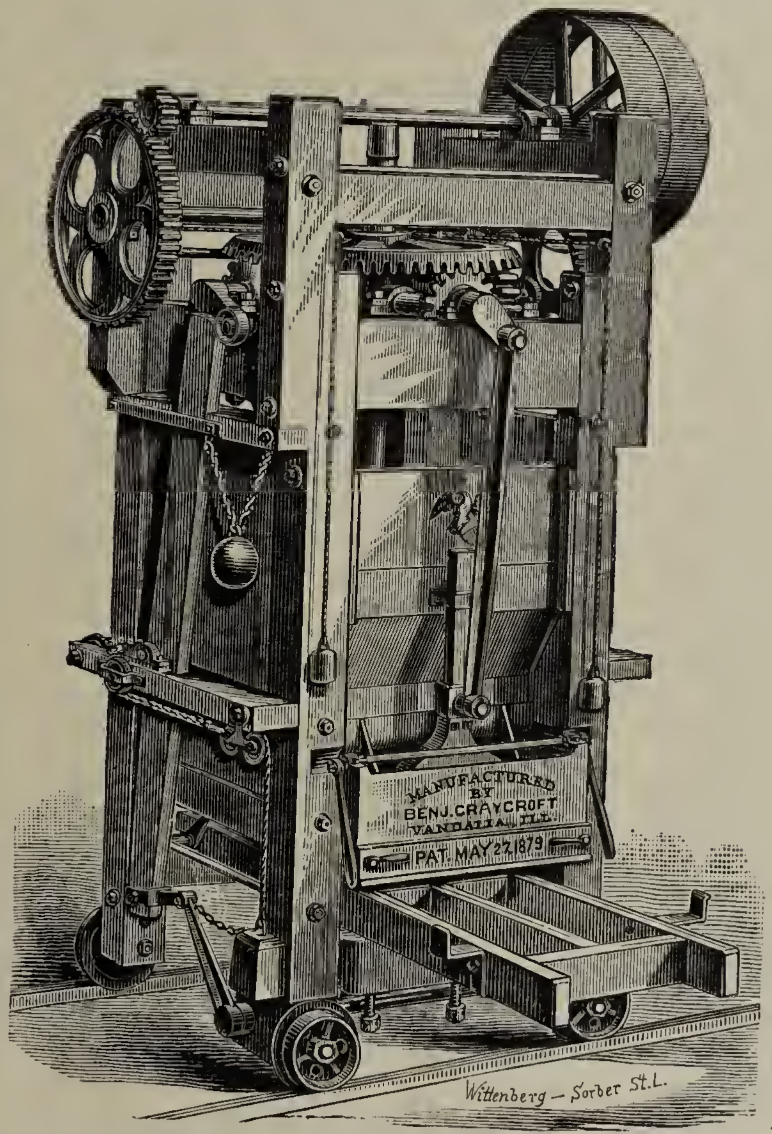
All are deeply impressed with the unprecedented popularity which the Ohio Machines have commanded and the distended orbs of the Populace of this great, glorious and enfranchised country are turned in astonishment to behold the miraculous feats which these machines are capable of performing in the production of brick and tile. The unparalelled strength and durability of the A and B Machines enforce the respect of their most bitter competitors who recognize the fact that they must hopelessly seek a more congenial clime and more distant worlds to conquer—leaving to the "Ohio" the enviable reputation so justly merited.

Do not fail to make sure of your future prosperity by immediately purhcasing one of the Ohio Machines which are being sold in large numbers.

It will result to your advantage to write FATE & FREESE, Plymouth, Ohio, for their illustrated catalogue of 1889. Their new "ad" appears on page 43 of this journal.

EAGLE BRICK MACHINE.

The attention of all parties interested in the manufacture of brick is invited to the improved Eagle Brick Machine as shown in the accompanying cut. It is simple in construction and any man of ordinary intelligence can operate and control it. The machine throughout is built for strength and durability and is so constructed that it is impossible for it to crush or break the moulds and a stick or stone will throw the machine out of gear and it will resume work as soon as the obstacle has been removed, which can be done in a moment by the operator, the press-box being so constructed that it readily glides upward or downward by the use of a lever. It grinds and mixes the clay thoroughly and the clay is pushed into the press-box by a plunger the plunger forming a back wall to the press-box so that when the press-foot comes in contact with the clay it presses it directly into the moulds thereby insuring full moulds and bricks with well defined corners and edges and nearer perfect than can be made by hand. The machine by its own action delivers the bricks on the carriage in front of the workmen.



This machine excels all others in lightness of draft and speed—one ordinary team being required to operate it. It makes six bricks at a time and twenty-four at each revolution of the machine. Six men and three boys is the usual force required to operate the machine. The horsepower machine will make from from twenty-five to thirty-five thousand bricks per day and steam gearing is so constructed that it can be belted on from any ordinary engine without the extra expense of a countershaft.

The number of bricks that can be made in a day depends upon the amount of work the gang can do. The machine will make good, nice brick as fast as any gang of men can operate it. Observation has taught that the only way to make good brick such as will dry without cracking and burn well and stand the climate, is to soak the clay from ten to fifteen hours in pits so that when it is ground by the machine all the particles will be thoroughly united and cemented together.

Brick made in this way shrink less in drying and burning than brick made by hand. When brick are dried upon the yard, three off-bearing trucks and twenty moulds are required to each machine. When pallets are used, which is regarded as much the best system, twelve moulds and three trucks are sufficient.

The moulds are made of selected cherry or walnut, well seasoned, accurately put together, strongly iron bound, and of any size required. The off-bearing trucks are made with two springs each and are strong and durable. The machine is sold upon its merits and guaranteed to do good work. For further particulars address the manufacturer, Mr. Benj. Craycroft, Vandalia, Ills.

Russia has placed a tax of one kopeck each on every egg sold in the kingdom, and the hens kopecking around with every mark of dissatisfaction.—*Epoch.*

THE CLAY-WORKER

INDIANAPOLIS, IND., July, 1889.

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One copy, one year (in advance)	$1.00
One copy, one year (if not paid in advance)	1.50
Six copies "	5.00
Ten copies "	8.00

☞Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES furnished on application.

Correspondence on all subjects of interest to Clay Workers is solicited. Communications from practical men will always be welcome. Address all communications to

T. A. RANDALL & CO.,
14 & 16 S. Tenn. St., Indianapolis, Ind.

WHAT WE WANT.

It has been our purpose from the beginning of the publication of the Clay-Worker to make it a means of helping others, by encouraging men of experience to write for its columns. We are always pleased to receive communications that are brimfull of observing, practical experience. Theory is all well enough if it is suggestive of progress, but theories that are backed up by experience are better. Theories, however, that are long drawn out—very fine, hair splitting, technical, and nothing more, are like the valley of Ezekiel's vision—of which the prophet said, "the bones are many, but very dry." And they are so "dry" that the plain every-day matter of fact man, with plenty to do, don't read them. And such communications we are compelled to return to the writers, or consign them to the capacious maw of the waste basket. Life is too short to waste in the reading of them.

We have been especially favored with an abundance of plain, practical, well digested, every-day experience, dished up in most part in a brief way, and our readers appreciate them.

We do not expect that business men will take the time to select the best literary phrases to express their thoughts but prefer them to dash them off in plain every-day speech. Our readers will understand them, and if there are no classic phrases in other tongues, it saves us the trouble of employing some learned professor to interpret them.

What we want is, gold nuggets of practical thought and experience. The gold may be in the lump and a little rough, if so, we will hammer it out a little and make it a blessing to others. Deliver us and our readers from having to wash a ton of earth to get a little shining sand.

VERDANCY OR CHEEK.

Occasionally we receive a communication, in which the writer evidently intends to bring before the public some invention or device not otherwise advertised. Such people seem to think that the subject is a matter of so much importance that we are under obligation to lay it before the public instanter and without cost to them more than the two-cent stamp, a sheet of paper and envelope. They doubtless conclude that we are running this institution for the amusement there is in it. The gratuitous advertising expected in this way is intended to benefit the writer of the communication, we understand that, the effect intended is to put money in their pocket, but alas—

"The best laid plans of mice and men
Aft gang aglee"—we don't print 'em.

THE AGITATORS EVIL WORK.

As we go to press we learn that the Chicago out-of-town yards have partially resumed operations, about half to two-thirds of the men returning to work under the old agreement with which they were entirely satisfied. Idle men and labor agitators (so called we presume because they agitate that they may not labor) from the city are trying to frighten the men who have returned to work by threats of violence but the employers have taken every precaution possible to protect their men and property, have employed deputy sheriffs to prevent trouble from the lawless element and anticipate no further serious trouble. They think the yards will soon be running full handed again and on the same terms as before.

This it seems is a remarkable instance of workmen being led by labor agitators to abandon their work and suffer the loss of thousands of dollars in wages in order to gratify the vain ambition of these self appointed selfish leaders—God save the mark. How long will intelligent American laborers submit to such unjust interference with their rights and duties, simply because it comes under the guise of labor organization? is a question we have hardly the patience to consider from the fact that the existence of such a condition is a reflection upon the good sense and manhood of our working men. As "Sic Vita," who is an entirely disinterested observer, tells in his letter in this issue, the men engaged were perfectly contented, there was no grievance whatever on their part yet, at the beck and call of these pestiferous labor agitators, most of whom have more brass than brains, are innocent of any labor and do not know the real meaning of honest toil, but leech a worthless existence from their blind followers, they give up their work entailing a loss to their employers of $600 a week and ten times that amount to themselves. It is an exhibition of the evil of bad leadership that working men should ponder well for, in almost every instance, the resulting loss and injury falls heaviest upon themselves and families, not on their employers.

THE USE OF HARD BRICK FOR STREET PAVING.

The very general attention directed to the use of hard brick for paving streets is unprecedented in street improvement. The towns and cities that have tested the use of "brick pavers" in the past few years have so fully established their merit that even the most skeptical, who have taken the pains to inform themselves upon the subject are quite ready to acknowledge their adaptability for this use.

There are, however, a few practical points worthy of consideration, of which we wish to treat briefly. The first is the character of the brick used. The importance of good material should never be overlooked in any kind of pavement. A block pavement should have sound blocks, or a stone pavement should have a uniform hardness and suitable dimensions, and the best of paving only should be used.

The *best* pavers do not depend wholly upon the hardness. A brick may be hard, and brittle—so brittle as to be unfit for use in paving a street.

A good paver is both hard and tenacious, that is, not easily broken—adhesive. This very desirable quality is not altogether the result of the method of manufacture, but is owing largely to the character of the material of which the brick are made. Method has something to do with the character of the paver, and the material more.

It is essential that the pavers should be made of the right kind of clay. Such clays are abundant, but all clays are not suited to this use. A good clay burned until the brick are partially vitrified at least is requisite for street pavers.

It is essential that they should be alike hard and tenacious. No material of a doubtful character should be allowed to enter into their construction. It is agreed, however, that the bottom layer need not be so flinty hard as the top layer, the latter being exposed to the wear of travel should be A No. 1 paver.

The character of the material being satisfactory, the next point of importance is the road bed, which should be brought to the required grade, and if inclined to be soft or springy in places should be underdrained with tile drains. A single line of tile in the center at a depth of three or four feet below the grade may be sufficient. There are springy clays that require two lines of drains, one on each side of the road bed, a few feet from the curbstone, as the width of the street and the character of the road bed may require to secure the best drainage.

The street may or may not be raised in the centre three or four inches. The grade should be made uniformly solid.

The grade complete, then cover with sand a depth of five or six inches, then lay the brick flat from curb to curb, breaking joints as in masonry, tamp the brick solidly and level, cover with two or three inches of sand and place the top layer of brick on edge as close as they can be set, breaking joints as before—setting from curb to curb and tamp well; cover with sand a depth of two inches.

The travel will settle the sand into the openings so completely that the street surface will be practically water tight in a short time, if subjected to much travel.

When complete the brick paved street is one of the best for general travel—very durable. Streets that have been in use eight ,ten or fifteen years give promise of lasting probably a quarter of a century longer with little repair.

The cost is easily figured. The grading, the sand, the number of brick per square yard for the first and second layers, the cost of brick delivered, the labor of laying, etc., are all easily computed.

It is true that streets so nearly level need not be so wide, which will leave room for a grass plat on each side between the sidewalk and travelled way which is very desirable in resident portions of towns and cities.

The space commonly allotted to gutters of five or six feet in width is repulsive to the sight, and withal expensive and inconvenient, and ought to have no place in a brick paved street. A street so nearly level and smooth will be travelled from curb to curb.

PRIZES FOR BRICK AND OTHER CLAY PRODUCTS.

The success of the Pottery and Porcelain Exhibition was so great last year, that the managers of the Pennsylvania Museum and School of Industrial Art have decided to follow it this Autumn with another Exposition, on a more extensive scale, and which promises to surpass it in size, variety and character.

Memorial Hall, in Fairmount Park, Philadelphia, has been selected as the place for holding the Exhibition, which is to be called the Exhibition of American Art Industry, and which is to open October 7th and continue until November 18th. The display is to be open this year to terra cotta, tiles, glassware, stained glass and mosaic work, as well as to pottery and porcelain.

Held in accordance with the terms of Joseph E. Temple Trust, and endorsed by the State of Pennsylvania, it is intended that the Exposition shall illustrate the present condition of the art industries in America. In order to stimulate an interest in the matter prizes are offered for superior work in the various departments and up to a late date about one hundred and twenty-five exhibitors have signified their intention of entering the competition.

Subjoined is a complete schedule of the prizes announced to be awarded in the leading departments.

MOSAIC SECTION:

Class No. 1, Floor Mosaic: 1st, $50; 2d, $35; 3d, $20.

Class No. 2, Wall Mosaic: 1st, $50; 2d, $35; 3d, $20.

Class No. 3, All Mosaic Work not included in the above: 1st, $50; 2d, $35; 3d, $20.

Class No. 4, General Exhibit: 1st, gold medal; 2d, silver medal; 3d, bronze medal.

Class No. 5, Designs for Mosaic Work: 1st, $50; 2d, $35; 3d, $20.

All are open to residents of the United States. In all classes except No. 4 persons winning prizes may have medals in place of the money.

TILE SECTION:

Class No. 1, Embossed Tiles, Enamelled: 1st, silver medal; 2d, bronze medal; 3d, diploma.

Class No. 2, Plain Tiles, Enamelled: 1st, silver medal; 2d, bronze medal; 3d, diploma.

Class No. 3, Plain Tiles, glazed or unglazed: 1st, silver medal; 2d, bronze medal; 3d, diploma.

Class No. 4, Encaustic Tiles: 1st, silver medal; 2d, bronze medal; 3d, diploma.

Class No. 5, Picture Tiles, in relief: 1st, silver medal; 2d, bronze medal; 3d, diploma.

Class No. 6, Hand Painted Tiles: 1st, bronze medal; 2d, diploma; 3d, $15; 4th, $10.

Class No. 7, Tile Modeling: 1st, silver medal; 2d, bronze medal; 3d, $20; 4th, $10.

Class No. 8, General Exhibit of Tiles: 1st, gold medal; 2d, silver medal; 3d, bronze medal; 4th, diploma.

All classes except Nos. 5, 6 and 7 are open to American manufacturers only; the others to all residents of the U. S. In the former classes persons winning the first three prizes may have medals instead.

TERRA COTTA SECTION:

Class No. 1, Vase, Capital, etc., in Terra Cotta: 1st, silver medal; 2d, bronze medal; 3d, $20.

Class No. 2, Panel, etc., in Terra Cotta: 1st, silver medal; 2d, bronze medal; 3d, $20.

Class No. 3, General Exhibit of Ornamental Terra Cotta: 1st, gold medal; 2d, silver medal; 3d, bronze medal; 4th, diploma.

Class No. 4, General Exhibit of Ornamental Bricks.—For the best general exhibit of ornamental bricks, enamelled or plain material, color, design and workmanship, considered: 1st, silver medal: 2d, bronze medal; 3d, diploma.

The last two classes are only open to American manufacturers and the others to all residents of the U. S. Winners of the first two prizes in classes No. 1 and 2 may receive $50 or $35 in place of the medals.

NEW INVENTIONS.

The following is a list of patents appertaining to brick, tile, terra cotta, sewer pipe, pottery, etc., and the machinery used in their manufacture issued since our last number: (A copy of any of them can be obtained by sending 25 cents, the official price, to Chas. E. Brock, Patent Attorney, 925 F St., Washington, D. C.)

402,628. Brick Kiln—R. Stanley, Nineston, Warwick Co., England.
402,940. Die for Brick Machine—A. Rundsen, Sycamore, Ill.
402,662. Brickmaking Device—Morgan & Baird, Burlingame, Kan.
402,897. Paving Block—J. L. Breed, Syracuse, N. Y.
402,930. Illuminating Tile—J. Jacobs, New York, N. Y.
403,235. Brick Machine—W. Weeber, Philadelphia, Pa.
403,276. Device for Handling Green Tile—J. W. Laughlin, Parkville, Ill.
403,646. Brick and Tile Cutting Machine—E. M. Burr, Champaign, Ill.
403,837. Roofing Tile — Gunsten & Braem, Denver, Col.
404,198. Brick Kiln—Z. Jochum, Ottweiler, Prussia, Ger.
405,066. Burning Brick—J. C. Anderson, Highland Park, Ill.
404,857. Brick Machine—B. Owen, Dayton, Ohio.
405,183, 405,184, 405,185, 405,186. Tile Machine—W. D. Sherman, Omaha, Neb.
405,631. Brick or Tile Cut-off Machine —W. Wallace, Willoughby, O.
405,281. Pulverizer—F. Taggart, Brooklyn, N. Y.
405,642. Mold for Making Sewers—J. Boade, Waco, Tex.

EDITORIAL NOTES and CLIPPINGS.

J. R. Martin will start a brick yard at Denison, Tex.

J. R. Goodwin has started a brick yard near Greenville, S. C.

It is proposed to start a brick and tile factory at Benton, Ark.

V. B. Batchellor is building a brick yard at Nashville, N. C.

Wells & Mays have erected a brick yard at Greenwood, S. C.

M. H. Donnelly is going to build brick works near New Britain, Conn.

The Star Brick Co. has been organized and is starting a yard near Lancaster, N.Y.

The Kiesel Fire Brick Co. intend building a $30,000 plant near Farmington, N. H.

The Harker Pottery Co., of East Liverpool, O., has been incorporated. Capital stock $100,000.

It is claimed that there is a very large deposit of fine fire clay at Oak Park, near Ft. Smith, Ark.

Geo. Maddux's pottery at Sacramento, Cal., was burned recently. Loss $5,000. Insurance $1,000.

P. F. Welch has bought the brick yard of Dr. O'Brien and John Cahill, at Turner's Falls, Mass.

The kiln sheds at Linley, Wright & Co.'s yard near East Brookfield, Mass., were burned recently.

The kiln sheds on the yard of Doyle & Callahan, Utica, N. Y., were burned the first inst. Loss $1,000.

The Cumberland Fire Brick Co. has been organized and will establish works near Middlesborough, Ky.

The Coosa Sewer Pipe Manufacturing Co. has been organized and will build works at Gadsden, Ala., to cost $40,000.

For bargains in machinery, property, desirable situations, or experienced help, read the "For Sale, Wanted, Etc." columns.

James Stockman, of Elk Point, Dak., lost 35,000 green brick during a storm one night recently. Moral: Build a modern yard.

The Wayne Brick & Tile Co., Olympia, Wash., has been organized with $50,000 capital. They intend to make brick, tile and sewer pipe.

The Washington Tile & Stone Co., Tacoma, Wash., has been incorporated, R. J. Carson, G. D. Hamor and T. W. Wampler, directors.

Drewery Bros. have sold their brick yard at Choccolocco, Ala., to J. T. White, of Easton, Md., who reports the outlook good for a lively business.

The Hampshire Pressed Brick Co., of Hampshire, Ill., report that the Raymond Clay Pulverizer furnished them by Chas. Kaestner & Co., Chicago, Ill., is a complete success in every particular.

The Peerless Brick Co., of Otto, Ills., after a thorough investigation of all the dry pressed brick machines in the market, have placed an order with Charles Kaestner & Co., of Chicago, Ills., for two of the Brewis Improved Presses, two Raymond Clay Pulverizers, and 100 horse power Engine, two 60 inches by 16 feet Steel Boilers together with all the machinery to be used in their plant.

We call special attention to the change of address of the Simpson Brick Press Co. who have removed from Minneapolis to Chicago, Ill.—see ad. on page 7—in order to more readily keep pace with the increasing demand for their machinery.

J. J. Williams writes that he intends to enter the brick business at Greenville, Texas, the coming season. He is partial to the stiff mud process and desires information as to the best means of handling brick from machine to dry sheds and kilns.

Jno. Mahaffe, now residing in Mississippi, but formerly a Hoosier, writes that there are fine openings for the establishment of brick and tile factories in that section. There is plenty of clay of excellent quality and a rapidly growing demand for both brick and tile.

In renewing his subscription, John Burnett, of Lake Charles, La., writes: "We are making brick and tile, using the Ohio Brick and Tile Mill with which we are much pleased. We find the Clay-Worker a great help and would not be without it for many times its cost."

Jno. M. Griffith, of Los Angelos, Cal., has ordered 40,000 pressed brick shipped to him from Baltimore, Md. Mr. Griffith, who formerly resided in Baltimore, is building himself a residence in his new home and will have none other than Baltimore brick for the exterior work.

We introduce to the trade on another page a new and sprightly candidate for trade favors—The "New Haven" Horizontal Steam Power Brick Machine, manufactured by the McLagon Foundry Co., New Haven, Conn., who will be pleased to correspond with those desiring information as to the special merits of their machinery.

The Lookout Clay Pipe Works, of Chattanooga, Tenn., has been organized with paid up capital of $80,000. The officers of the company are: T.G.Bennett, Jackson, Mich., president; John G. Rawlings, Chattanooga, vice-president; M. A. Woodburn, secretary and treasurer; John S. Smith, of Jackson, Michigan, superintendent.

The brick interests of Seattle, Wash., are just now in a most flourishing condition. Since the great fire the price has advanced to $10 a thousand on the yard and the demand will doubtless exceed the supply through the building season. There are now twenty yards in Seattle and vicinity with a combined capacity of 500,000 a day.

The Berlin (Conn.) Brick Co. recently made 66,173 first class pallet brick with their regular gang of men in thirteen and a half hours actual running time with one "New Haven" machine, cut of which appears on page 36. That speaks well for both the men and the machine. The machine runs at the rate of 13½ molds a minute and certainly did not give the men much trouble· They think it is a good run and if anyone can beat it, they will try to do better still. Next!

We have recently received and placed in the cabinet in our sanctum a few sample bricks made by the Tiffany Pressed Brick Co., of 161 La Salle St., Chicago. The brick are indeed very fine, we have never seen any better. The ornamental brick are beautiful in design, well nigh perfect in execution, while the surface, edges, color and texture, are all that can be desired. They are justly admired by all who see them and fill completely the requirements of the most exacting architect or builder.

We expected to give a sketch and description of the Central Press Brick Co.'s new works at North Baltimore, O., in this issue, but the engraver has disappointed us. This plant has been erected and is now in operation under the supervision of Mr. W. D. Richardson, one of our well-known contributors, and is thought to be a model dry press brick factory. They are using the Simpson presses, and burn with natural gas in Eudaly's patent kilns and are turning out an excellent grade of pressed and ornamental brick.

With the next (August) issue of the Clay-Worker we will begin the publication of a series of papers on the subject of *"Sewer Pipes and Their Manufacture,"* from the able pen of Mr. Alfred Crossley. Though an extensive and very important industry the manufacture of sewer pipes has never before been discussed carefully in a practical manner, it remaining for the Clay-Worker to give to the craft the first practical and valuable treatise on the subject as we have done before in other branches of clay work. We also have on hand several interesting communications on other topics, which came too late for this number but will bear keeping, and enables us to safely promise that the August Clay-Worker will be a most interesting issue.

NEW ADVERTISEMENTS.

Fate & Freese,
Brick and Tile Machinery.
C. & A. Potts & Co.,
Clay-working Machinery.
Jonathan Creager's Sons,
Brickmaking Machinery.
Michigan Brick & Tile Machine Co.,
Brick and Tile Machinery.
J. W. Penfield & Son,
Upright Stock Brick Machine.
I. & M. Wolff & Coleman,
Artificial Dryers.
The McLagon Foundry Co.,
Brick Machinery.
International Terra-Cotta Lumber Co.,
Porous Earthenwares.
Cincinnati Corrugating Co.,
Iron Roofing, Etc.
Link Belt Machinery Co.,
Clay Conveyors and Elevators.
M. F. Williams & Co.,
Brick Shaping Machine.
Small Ads., For Sale, Wanted, Etc.

UNCLE DAVID'S "JEREMEDIDLER."

"He is a 'Jeremedidler,'" Uncle David said.

"A what?"

"A 'Jeremedidler.'"

"Well explain, please, what you mean by that term. We are in the dark," we replied.

Uncle David replied: "I mean that Jacob is a representative man of his kind; a class of men that we can hardly dismiss from our service, and still they are not profitable to keep. Jacob has worked on this yard for three years, he has a large family dependent upon his labor. I feel sorry for the family and for him, and so I let him stay and pay him the regular wages. But he is not a driving man, in fact, he is otherwise. Everything I set him at he finds some way most naturally to piddle at it, not intentionally, perhaps, but the result is much the same. He is always trying some new way of doing things, with the intention apparently of expediting his work, but his little devices and changes all come to naught. Jacob is always on hand and ever full of expedients, if you let him try them, but some way or other he gets hold of the wrong end of things and still he is seemingly anxious to render efficient service, and manifests an interest in the work, but he don't 'get there," as the boys say, for the reason that his efforts are not well directed. And it is so with him in everything he undertakes to do. I like him for his quiet unobtrusive ways, he seems devoted to my interests and is never heard to complain—never conspires with others to work me for more pay or less working hours, and has been known to oppose any and all movements of the kind. He is honest and as regularly on time as any man on the yard, but I can't get the work out of him that I can out of the others because of his wrong ended ways, so I just call him a 'Jeremedidler' and let him stay. I conclude that for the good of his family and what he really intends in the way of service make it expedient for me to let him remain, while at the same time he is a 'Jeremedidler,' and that is all we can say of him."

We pondered Uncle David's rather practical way of reading the man and after all we looked along the line of our observations and here and there we could see the 'Jeremedidlers' among the employed and the employers. There are many of Uncle David's 'Jeremedidlers,' who, some how or other, get hold of the "piddling" end of everything they undertake to do.

METHOD OF MANUFACTURING BRICK Patented to J. F. Clark, May 15, 1888.

Claim—An improvement in the art of making brick, which consists in cutting the brick from a column of clay as it emerges from the machine, in a Curved Direction, so as to form one side Convex and the other Concave, and then straightening the sides of the brick by subsequently drying and burning the same, as set forth.

We are daily in receipt of letters from parties wanting to buy our cut-off for cutting brick as above set forth. We wish to say to the brickmakers through the Clay-Worker that we do not furnish this cut-off to be used on any machine except our own make.

MICH. BRICK AND TILE MACHINE WORKS,
Morenci, Mich.

A Letter of Recommendation.

Minneapolis, Minn., June 28, 1889.

Mich. Brick and Tile Machine Works, Mor.nci, Mich.

GENTLEMEN—Our machine (No. 6 Special) is doing finely. We are making sixty thousand bricks right along every day when we run. We can make more than that when we have good, suitable clay. The machine is all right.

Yours Respectfully,
S. D. MORRISON & CO.,
1500 Washington Ave., North,
Minneapolis, Minn.

Mention the Clay-Worker
When writing to Advertisers
Mention the Clay-Worker.

Davis's Bricks, Tiles and Terra-Cotta.

JUST READY.

A NEW EDITION.

A Practical Treatise on the Manufacture of Bricks, Tiles, Terra-Cotta, etc.; including Hand-Made, Dry Clay, Tempered Clay, Soft Mud and Stiff Clay Bricks, also Front, Hand Pressed, Steam Pressed, Re-Pressed Ornamentally Shaped and Enamelled Bricks, Drain Tiles, Straight and Curved Sewer and Water Pipes, Fire Clays, Fire Bricks, Glass Pots, Terra-Cotta, Roofing Tiles, Flooring Tiles, Art Tiles, Mosaic Plates, and Imitation of Intarsia or Inlaid Surfaces, comprising every important product of Clay employed in Architecture, Engineering, the Blast Furnace, for Retorts, etc., with a History and the Actual Processes in Handling, Disintegrating, Tempering and Moulding the Clay into the Shape, Drying Naturally and Artificially, Setting, Burning with Coal, Natural Gas and Crude Oil Fuels, Enamelling in Polychrome Colors, Composition and Application of Glazes, Etc., including Full Detailed Descriptions of the Most Modern Machines, Tools. Kilns, and Kiln Roofs used. By Charles Thomas Davis. Second Edition. Thoroughly Revised. Illustrated by 217 engravings. 501 pages. 8vo.

Price $5.00, *by Mail, free of postage to any address in the world.*

CONTENTS—Chapter I. The History of Bricks. 11. General Remarks concerning Bricks, Their Size, Strength and other qualities. Ornamentol Bricks, Architectural Terra-Cotta, Blue Bricks, Saltpeter Exudations upon Brick Work. III. Enamelling, Glazing and Ornamenting Bricks and Tiles, Earthenware, etc. IV. Selecting Clays for Various Kinds of Bricks—The Different Varieties of Clay—The Characteristics, Qualities and Localities—How to Color Bricks Red—Kaolin—Terra-Cotta Clays—Fire Clays—Exploring, Digging and Marketing Fire Clays—Washing Clays. V. Making and Burning a Kiln of Hand-Made Bricks. VI. Manufacture of Dry Clay Bricks. VII. The manufacture or Tempered Clay Bricks. Including a description of the Most Modern Machinery Employed. VIII. Kilns. IX. The Manufacture of Pressed and Ornamental Bricks. X. The Manufacture of Fire Bricks. XI. The Manufacture of Drain Tiles. XII. The Manufacture of Sewer Pipes. XIII. The Manufacture of Roofing Tiles. XIV. The Manufacture of Architectural Terra-cotta. XV. Ornamental Tiles, Etc. Index.

☞*A circular of 6 pages quarto, giving the full Table of Contents of this important book, with specimens of the illustrations, will be sent free of postage to any one in any part of the world who will furnish his address.*

HENRY CAREY BAIRD & CO.,
INDUSTRIAL PUBLISHERS, BOOKSELLERS & IMPORTERS
810 Walnut St,, Philadelphia, Pa., U. S. A.

OUR 1889 CATALOGUE

Is in Printer's hands. Parties desirous of obtaining same will please forward their address at once to insure prompt mailing. Address,

Link-Belt Machinery Co.,
CHICAGO & MINNEAPOLIS,

---OR---

Link-Belt Engineering Co.,
NICETOWN, PHILADELPHIA, PA., &
49 DEY ST., NEW YORK, N. Y.

[Mention the Clay-Worker].

FOR SALE, WANTED, ETC.

☞Advertising rates in this column 20 cents a line, or 3 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion.☜

FOR SALE. Two Whittaker Semi-dry Machines in good condition. Can be seen at work. Address
7 1 d. **WHITTAKER BRICK CO.**, Kan. City, Kan.

WANTED. A temperate, skillful brick sorter. Address, stating experience and salary expected. (7 1 t.) **W. D. RICHARDSON**, North Baltimore, O.

WANTED. A situation by an experienced and reliable brickmaker and burner. Familiar with old and new methods of burning. Address
7 tf t. "**BRIX**," Care Clay-Worker.

FOR SALE. One Wallace Clay Crusher and Stone Separator, also one pug mill; both in good repair, regardless of cost.
J. W. BECKETT,
7 1 c. E. E. Pittsburgh, Pa.

WANTED. A brickmaker who understands running Penfield Machine and is a good burner, to take charge of a yard at Decatur, Ala. **P. H. MORRIS**,
7 1 d. Eufaula, Ala.

FOR SALE. Stedman Pulverizer; new improved. 40-inch, with fly-wheel; in perfect order.
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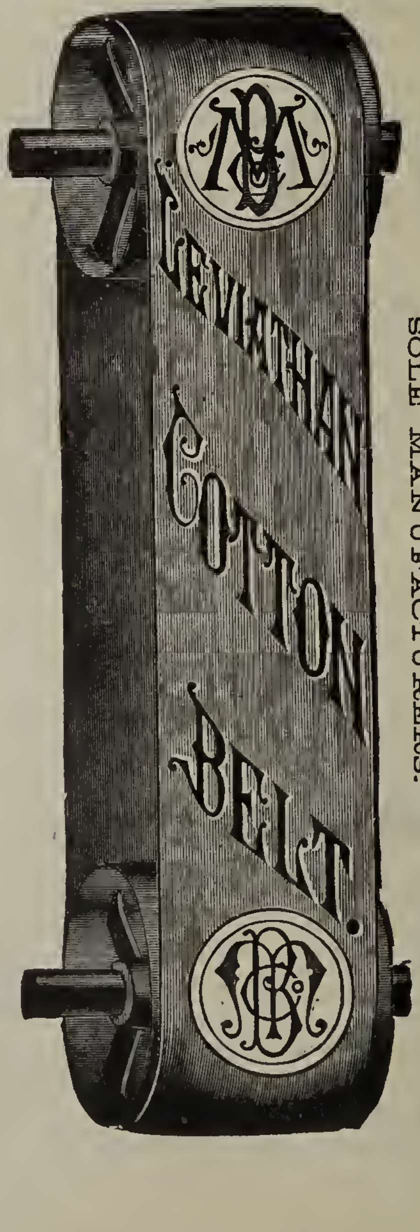

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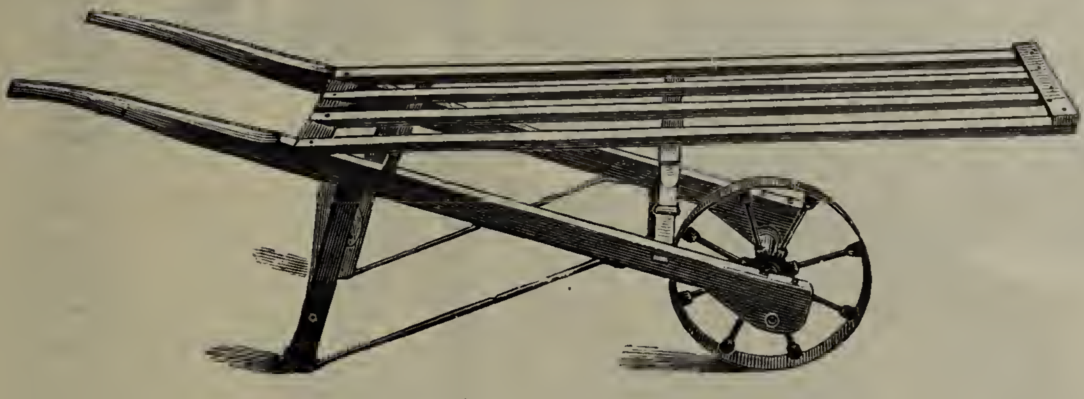

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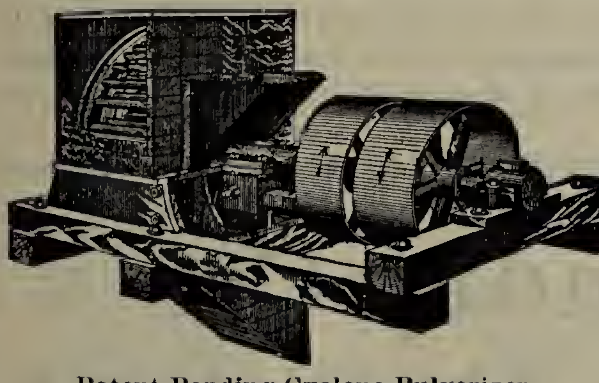

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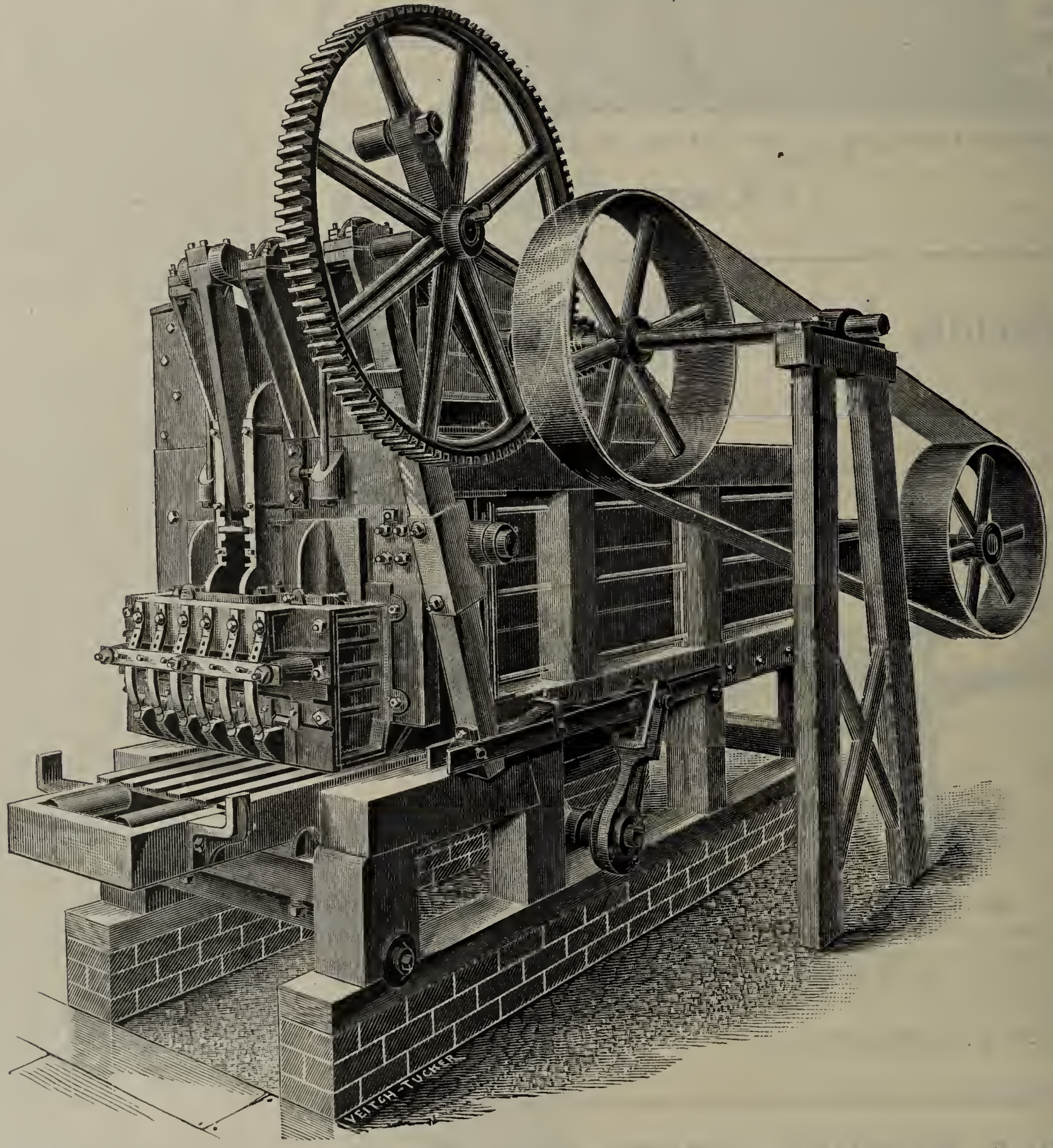

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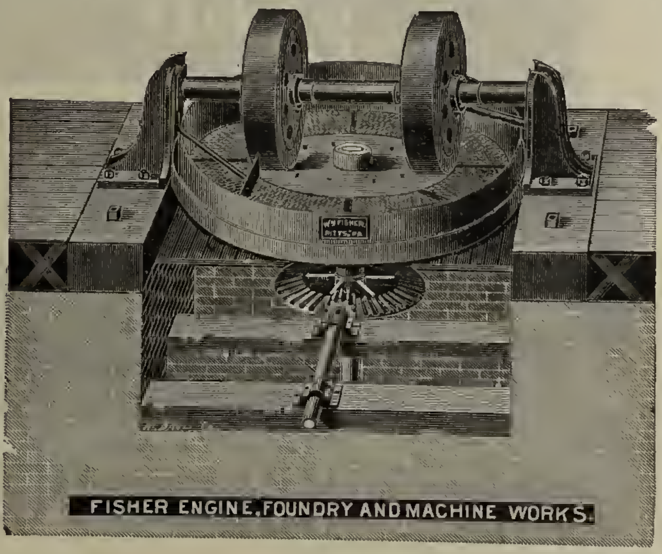
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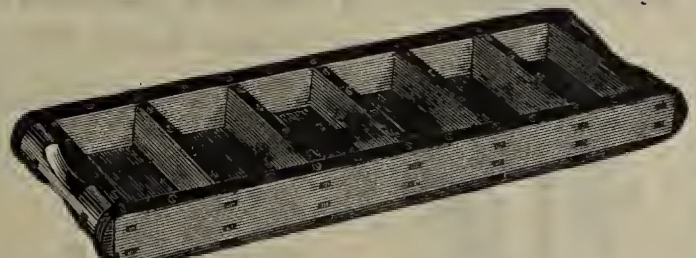

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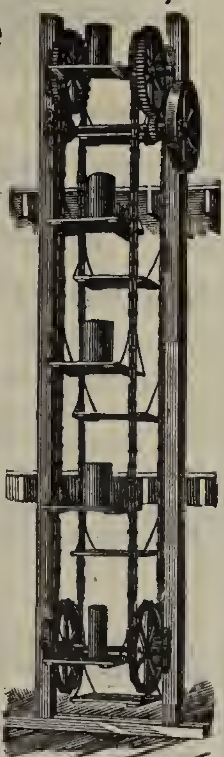

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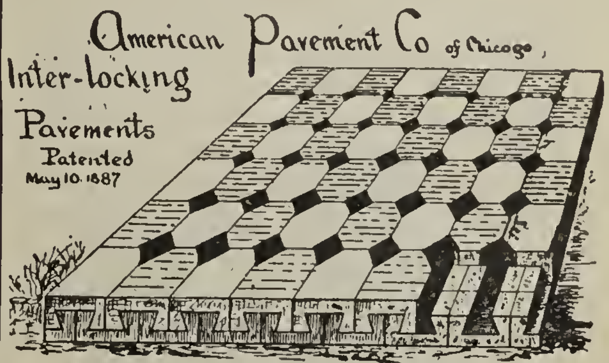

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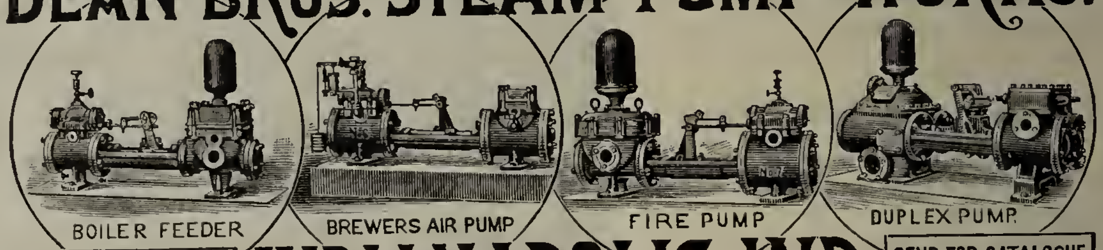

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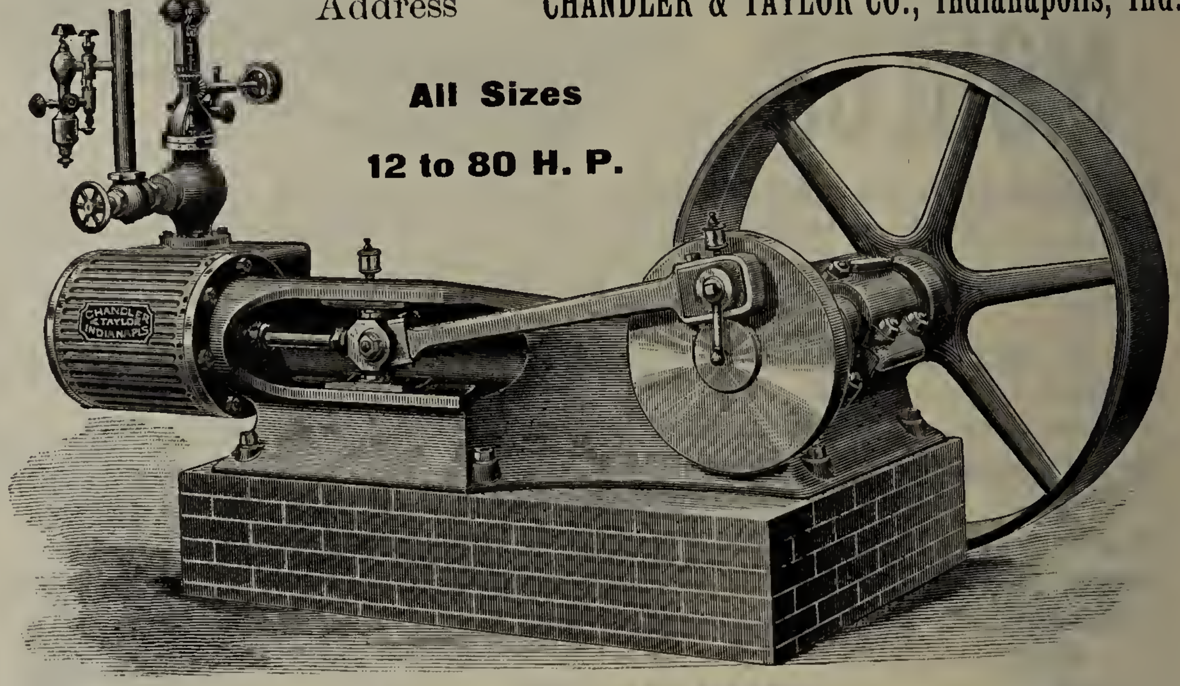

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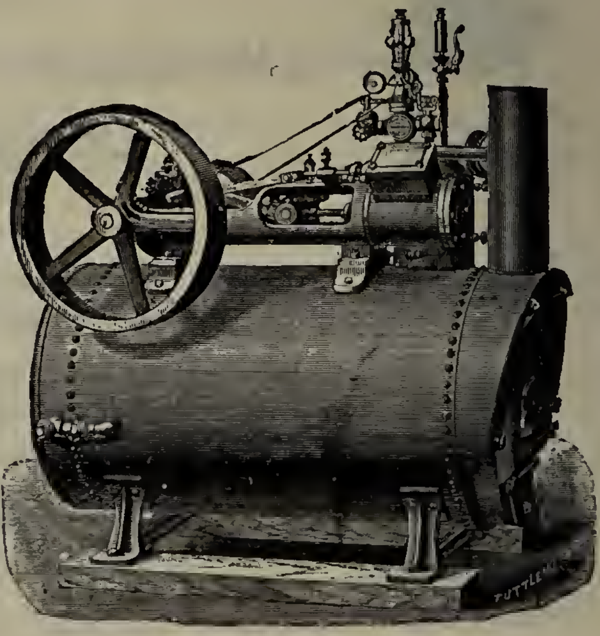

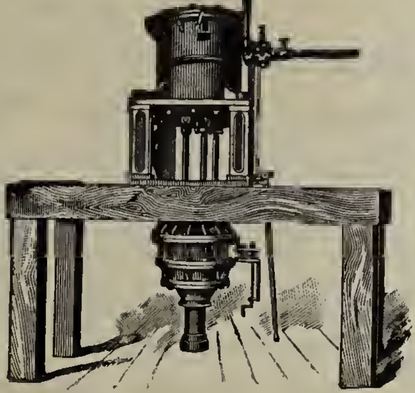

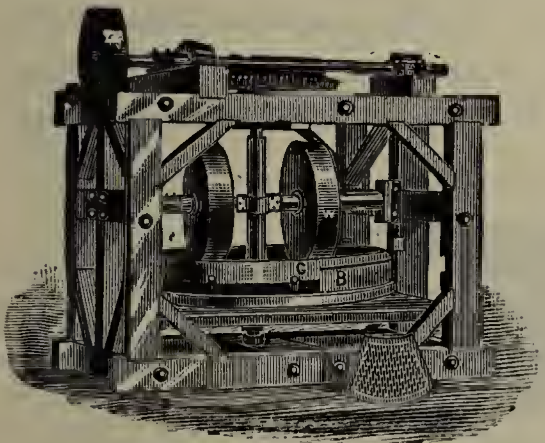

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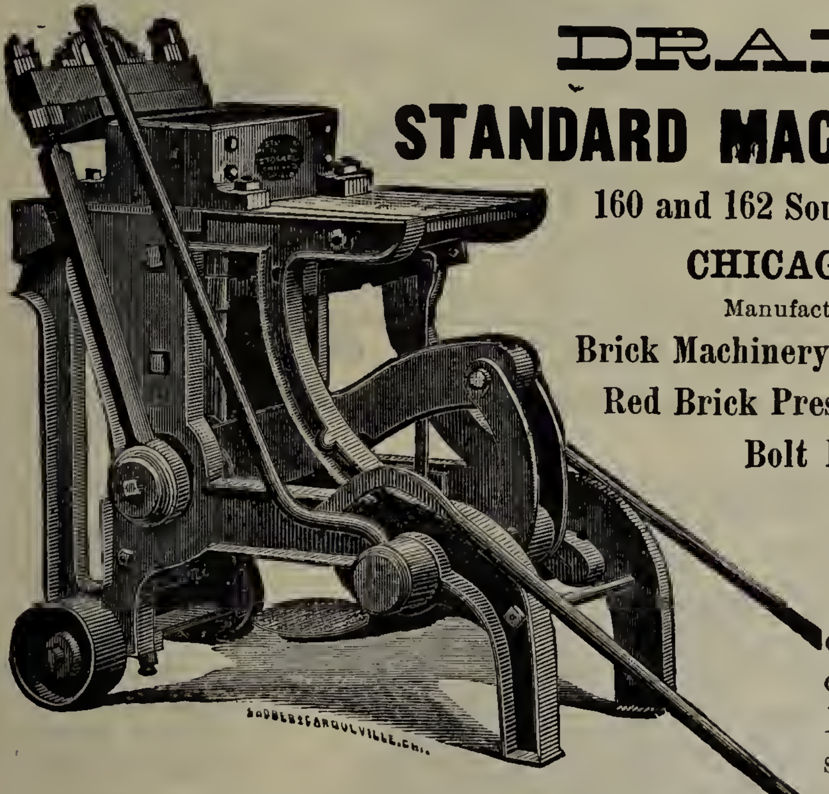

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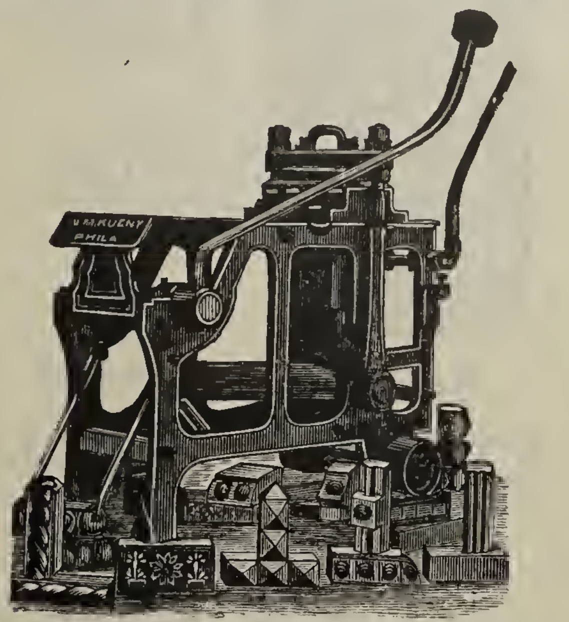

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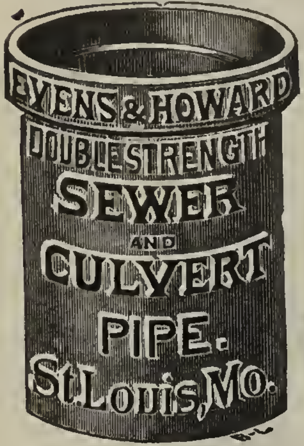

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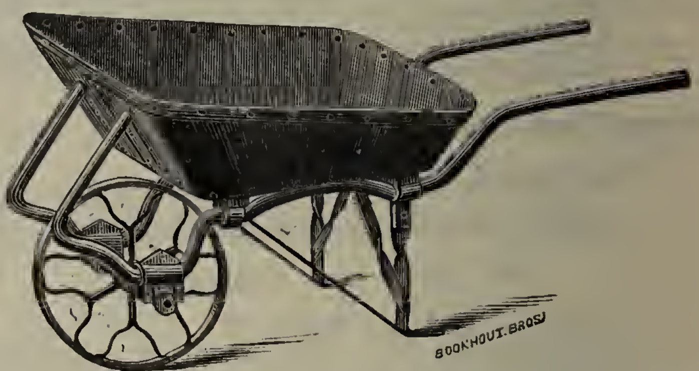
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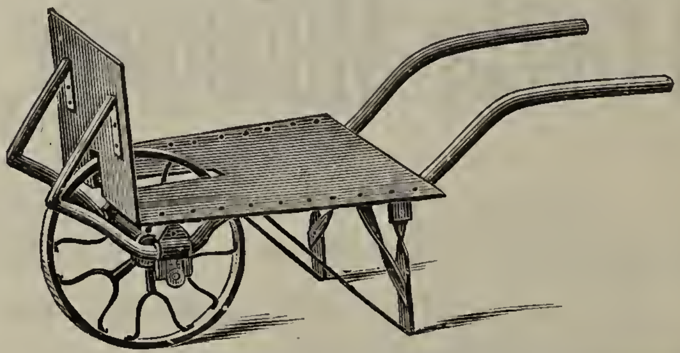

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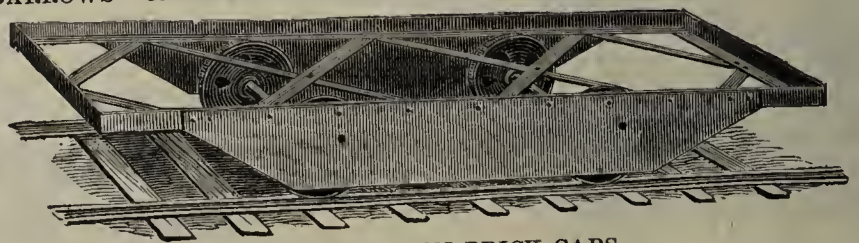

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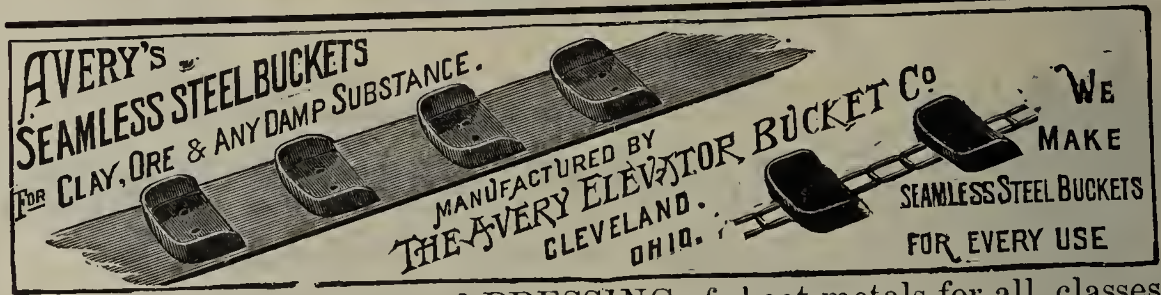

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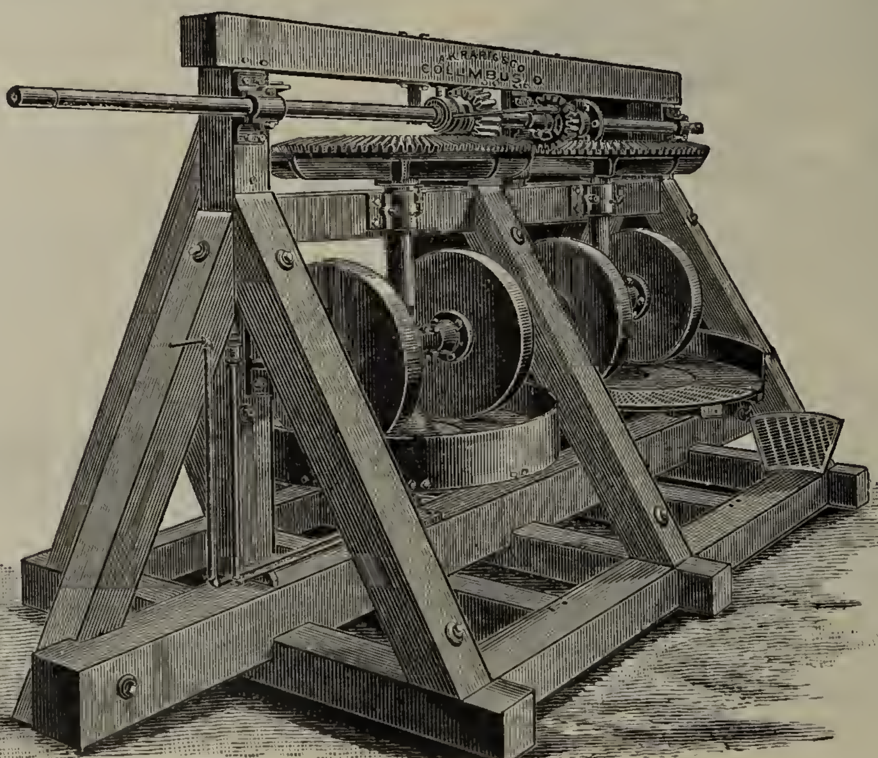
Steam Sewer Pipe and Tile Presses, Grinding and Tempering Pans, Sewer Pipe, Tile and Fire Proof Dies, etc.; Automatic Cut-off and Slide Valve Engines, Boilers, Pulleys, Hangers and Shafting, Steam Pumps, Pipe Fittings and Architectural Iron Work.



R.J.H.SMITH-CO.CIN.O.

Clay Excavated by the Marion Steam Shovel Co's shovels makes a 10 per cent. better brick and in some qualities of clay 25 per cent. better brick. All this by the thorough mixing of the different stratas of clay, which can be ac. complished only by use of Steam Shovels. 25 per cent-saving over and above hand labor. These points are worthy of your careful consideration. Are they not, Brickmakers? Shovels sold subject to a test of their merits in your own clay pit; and if we cannot prove as above represented, shovel is not yours. Prices low, terms easy. We do not recommend the using of Steam Shovel service in yards making less than 50,000 brick per day.

Address for any further information,

THE MARION STEAM SHOVEL CO., Marion, O.

Boehncke & Rohwer's Patent Continuous Brick Kiln.

CONTINUOUS KILN CO.,
1110 Farnum Street,
OMAHA, NEB.
Patentees for the U. S.

80 per cent. of fuel saved

A perfect result from any refuse fuel.

No loss in burning.

All goods uniform in color and quality.

Bricks burnt in summer and winter.

Construction of the kiln very cheap.

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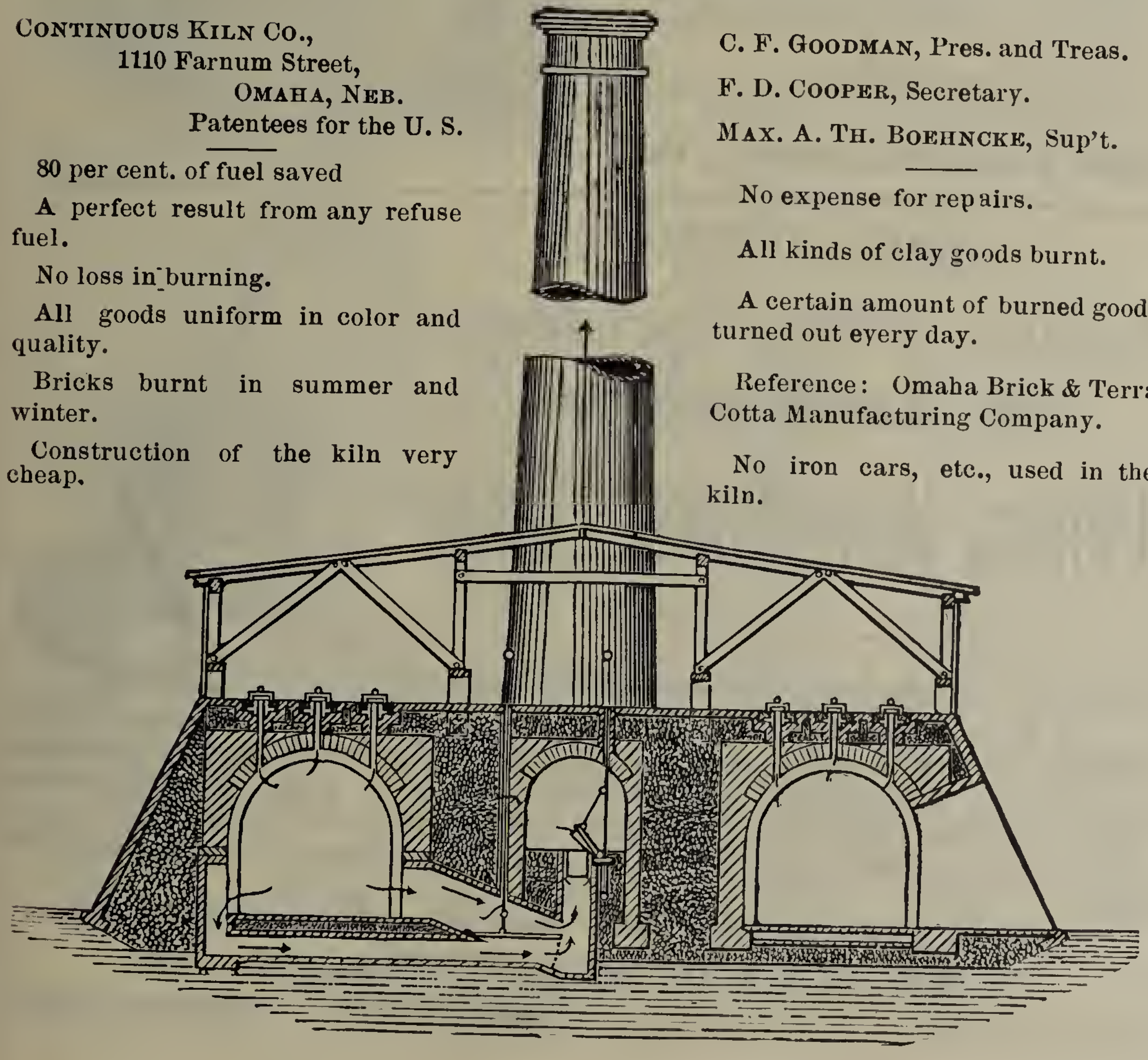
No expense for repairs.

All kinds of clay goods burnt.

A certain amount of burned goods turned out every day.

Reference: Omaha Brick & Terra Cotta Manufacturing Company.

No iron cars, etc., used in the kiln.



JUST PUBLISHED.

Tables of Analyses of Clays, Etc.

howing the composition of all the principa clays in Europe and America, a book for all interested in clays and their products. Compiled and arranged by Alfred Crossley. Price, One Dollar. Postage Paid.

Extracts from the Author's Preface—Every clay owner should know all about his clay if it is of any value, and one of the first steps to a full and correct knowledge of clay is to have it subjected to a chemical analysis. But it is not enough for a man to know his own clay, he should also acquaint himself with the properties of other clays. and in fact, by his very knowledge of others he will be the better able to judge of the value or otherwise of his own. This little book is intended in an humble way to supply that knowledge. In it will be found the analyses of the best known and most celebrated clays of the Old and New World, with many others of lesser note but in some cases, of equal quality. * * * To each analysis, as far as known, I have appended a remark as to the character of the goods actually made from it. This, I apprehend may be useful as affording a clue to what line of manufactures other clays of like character may be very properly applied. * * * To make the book more useful to the practical man, I have added some blank space at the end, ruled and headed, so that parties can fill in the analysis of their own clay and any others in which they may be interested.

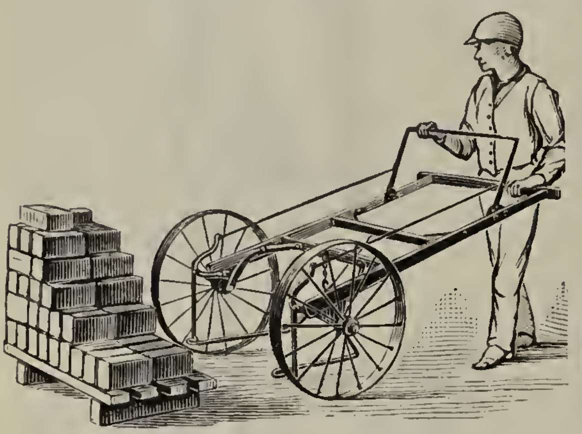
Sent post paid, on receipt of price by the publishers

T. A. RANDALL & Co.,
Pub's "Clay Worker," Indianapols.
Or by the author, A. CROSSLEY,
Ironton, Ohio

STEELE'S IMPROVED Brick Truck

—AND—

Portable Hack.



The principle of handling and drying bricks by the Portable Hack System has been perfected in this Truck and VENTILATED HACK BOARD, being the most practical Truck and method ever yet introduced, saving labor in handling and time in drying bricks. Can be used in any yard not too steep. Is especially adapted for medium dry clay machines.

☞Is fully warranted to work as represented.

Orders Solicited.

Territory for sale in the Northern and Western districts. Address,

J. C. STEELE, Patentee,
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Queen & Crescent Route.

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Most · Picturesque · Route SOUTH.

DOUBLE DAILY SERVICE OF
FAST THROUGH TRAINS
From Grand Central Union Station,
CINCINNATI,
For Chattanooga, Knoxville, Memphis, Birmingham, Meridian, New Orleans, Vicksburg, Shreveport, Mexico, Texas and California.

CINCINNATI TICKET OFFICES:
West Fourth Street near Vine, and Grand Central Union Station.

OHN C. GAULT, Gen'l Manager.
R. CARROLL, Gen'l Superintendent
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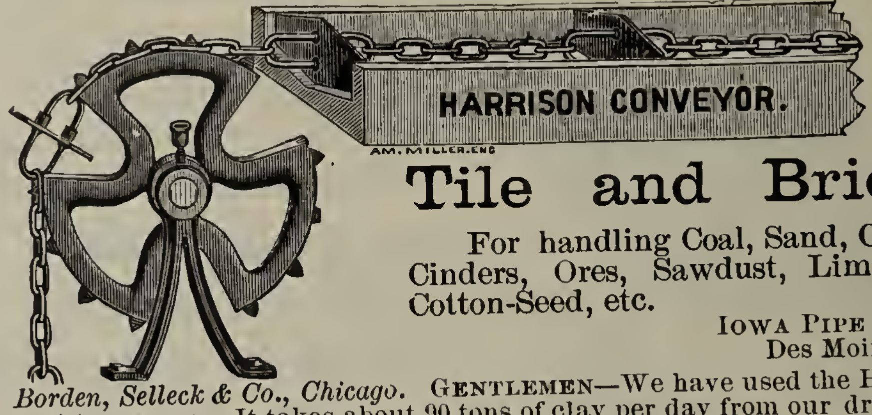
Acting General Pass. Agent, Cincinnati.



—FOR—

Tile and Brick Yards.

For handling Coal, Sand, Clay, Grain, Tan-Bark, Cinders, Ores, Sawdust, Lime, Cement, Shavings, Cotton-Seed, etc.

IOWA PIPE AND TILE CO.,
Des Moines, Iowa, Sept. 24. 1887.

Borden, Selleck & Co., Chicago. GENTLEMEN—We have used the Harrison Conveyor for the past two years. It takes about 90 tons of clay per day from our dry pan and distributes it through our cellar. Gives good satisfaction. Yours Truly, IOWA PIPE & TILE CO.

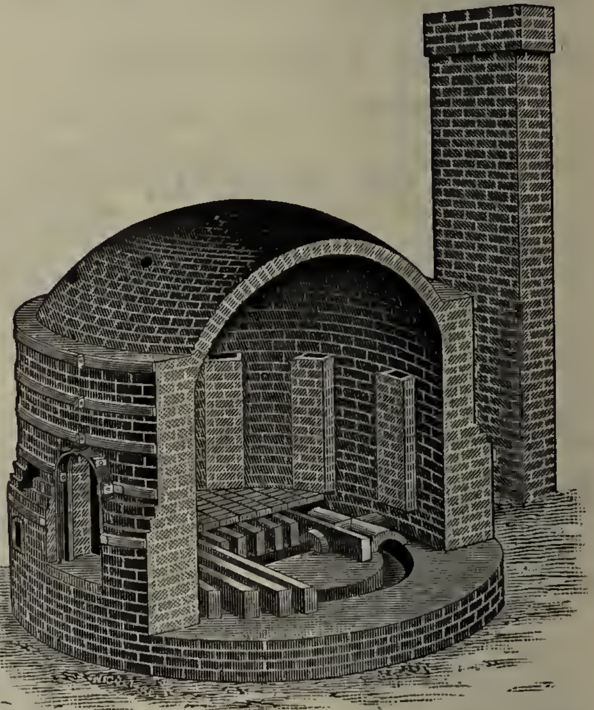
BORDEN, SELLECK & CO., *Mfrs. and Sole Agents,*

Send for illustrated catalogue.
48 & 50 Lake Street, CHICAGO

"NEW DISCOVERY" KILN.

PIKE & SCHOPP, INVENTORS.

It Heads the Procession!



The "New Discovery" is a round down draft kiln with no grates, furnace doors, sub-arches or dampers, except at the stack, bound with iron bands, securely fastend to an arched irn door frame. This kiln is the result of years of experience by practical and successful tile and brickmakers, at a cost of thousands of dollars.

It is a conceded fact that perfect drafts and perfect combustion are indispensable to a perfect kiln. *Such* is the "New Discovery." This kiln is adapted for burning almost anything made from clay; can be constructed for either wood or coal and burn evenly throughout; is easily managed—will save in fuel, time of burning, wages of the burner, use of the kiln—nearly one-half.

The proprietors of this invention propose to sell kiln yard or territorial rights reasonably and guarantee it to be the best kiln the purchaser ever saw or used.

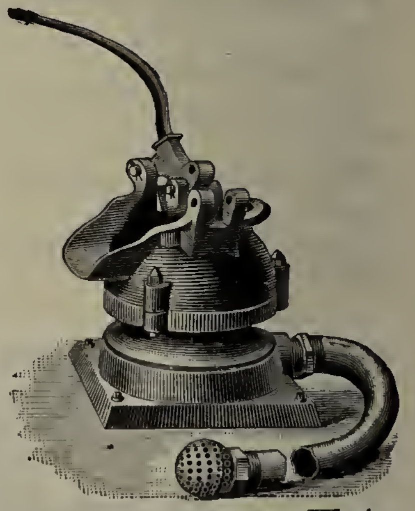
Everybody is cordially invited to visit our works, where a kiln is, almost, in constant operation. We also nave an arched iron door frame which is indispensable to a perfect kiln.

Send for circulars and testimonials.
We shall protect our patents from infringements.
Reliable resident agents wanted. Address—

PIKE & CASTLE, Chenoa, Ills.

3000 TO 4500 Gallons of Water (per hour.)

BY HAND-POWER.



Pumps, Hand-Power Pumps

(LOUD'S PATENT.)

These pumps are simple, durable and low-priced.

A large capacity and easy working pump for **Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries,** or wherever it is desired to raise a *large quantity* of water by *Hand-power.* The pump has large valves (*accessible by hand*) and will pump water containing *sand, gravel, mud, sewage matter, etc.*, without *choking* or any *perceptible wear.*

Send for circular and price-list. Manufactured by

THE UNION HARDWARE CO.,
TORRINGTON, CONNECTICUT.

Grant & Murray's Improved Brick Machine.

In placing this Improved Machine before the public and setting forth what we claim for the merit of the machine, we guarantee to fully verify in the practical operation of the machine.

This process of brickmaking has been thoroughly tested and has proven to be a perfect success, and is as cheap a process as any on the market. The machine is constructed wholly of iron and weighs upwards of twenty thousand (20,000) pounds. It is simple and durable. The operation of it is easily understood. Its capacity is two thousand (2,000) brick per hour. The brick are far superior in strength and finish to common brick. The clay is worked at a consistency that under pressure deposits the greatest amount of clay in the brick, giving them great strength and thereby making them especially adapted for street paving purposes. In actual tests where there has been the strongest competition there has not been a brick submitted that would stand near the pressure, absorb as little water, or stand the wear by friction as these brick.

If Brickmakers or those that are going into the business will send us a barrel of their clay we will fully demonstrate the quality of the brick in this respect.

Not having sufficient capital we desire to dispose of an interest in the patent and business generally to some one, or company that would have sufficient capital to push the manufacture and sale of this machine as the merit of it would justify or demand.

We ask the attention of manufacturers desiring a specialty to the above, with a view to the manufacturing of the machines.

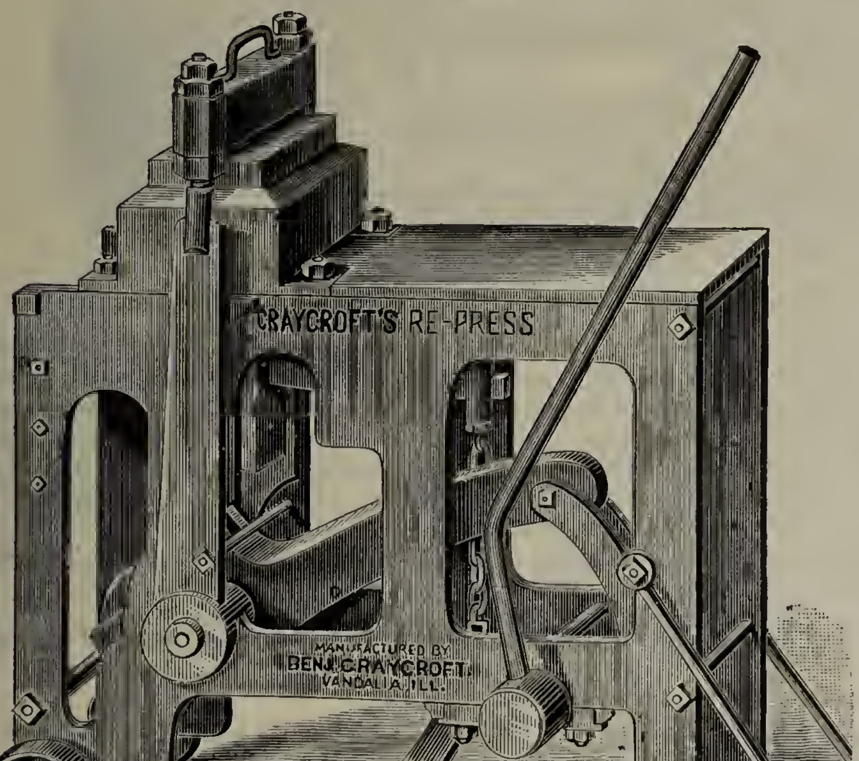
Machines can be furnished on short notice. Correspondence solicited. For further particulars, prices, etc., address

GRANT & MURRAY,
Middleport, Ohio.

Mention the Clay-Worker].

The Craycroft Re-press Brick Press.

For Re-pressing Red and Fire Brick.



This Re-Press, Fully Guaranteed, will be shipped to Responsible Parties on Trial for a Reasonable Time.

This press has all modern improvements, and is equal to any in the market.

It is manufactured of steel, wrought and cast iron, and cast iron, and combines strength, power and durability.

It is used for repressing red brick, which are used for the fronts of fine buildings, and enables the manufacturer to make good pressed brick at a slight advance over the cost of ordinary red brick.

The press is also used to repress fire brick.

Sample bricks from this machine furnished on application.

Approximate Weight, 900. Price, $120.00.

Address, **BENJ. CRAYCROFT, Vandalia, Ill.**

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All work before the Patent Office carefully and promptly attended to. Charges moderate. Write for particulars.

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For coloring Brick, Mortar and all Clay Products a deep and permanent red. Most, if not all, colors in the market are artificially prepared. Colorific is a natural color. References and directions furnished for use. Sample free. Ask for price of

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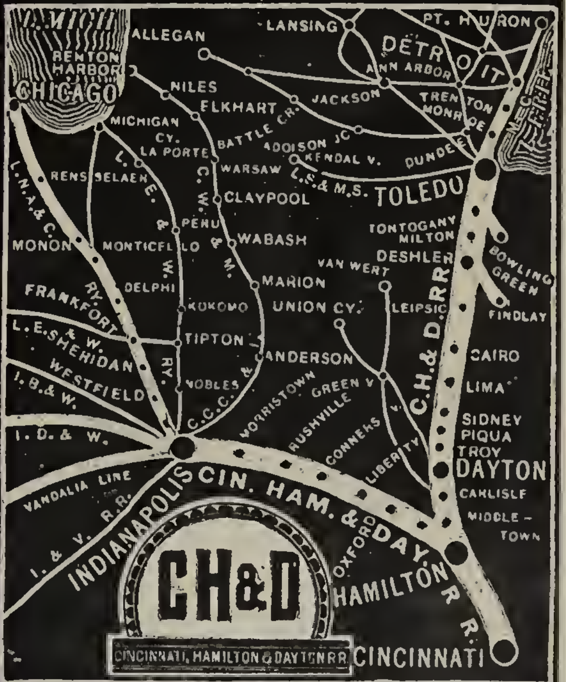

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Reclining Chair Car Cincinnati to Decatur, Ills., Springfield, Ills. and Keokuk, Iowa. Daily.

For full information, Tickets, Sleeping Car space, etc., inquire of or address

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This system of railroads embraces the following lines: The Chicago, St. Louis & Pittsburgh railroad; the Jeffersonville, Madison & Indianapolis railroad, and the Indianapolis & Vincennes railroad.

The Chicago, St. Louis & Pittsburgh railroad is the Great Through Line to the East, via Columbus and Pittsburgh.

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The facilities and advantages of the Pan-Handle System are in very particular in keeping with the progressive spirit of the times and the demands of the traveling public Its facilities for the transportation of its patrons are sufficiently adequate to guarantee to all comfortable and pleasant accommodations.

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Short Line to Kansas City and the West.

Lv Indianapolis	8.35 am.	11.00 pm. (daily.)
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The only line runing reclining chair cars daily between Indianapolis and Keokuk, Ia., without change, running through Decatur, Springfield, Jacksonville, Chapin, Bluffs and Clayton, Ills. To Quincy, Ills,, and Hannibal, Mo., without leaving the train.

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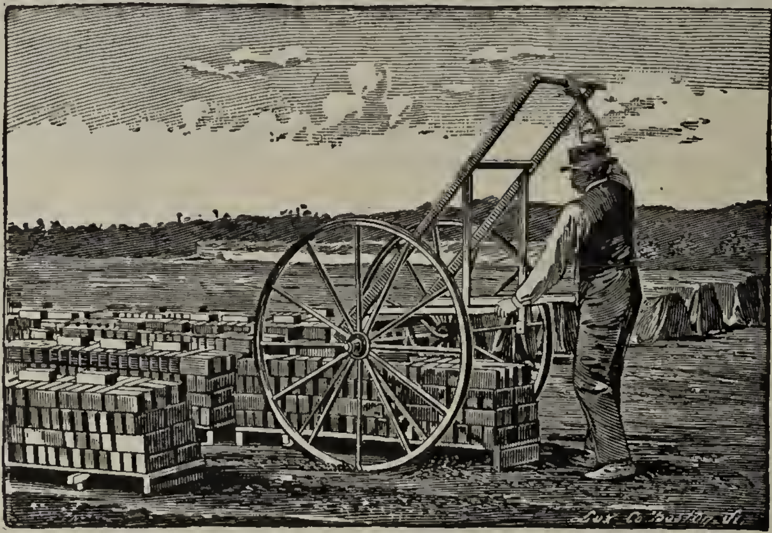
Economy Portable Brick Hake.

Patented Sept. 22, 1885, Re-issued Feb. 23, 1886. By
M. WALKER and E. MINER, Yankton, Dakota.



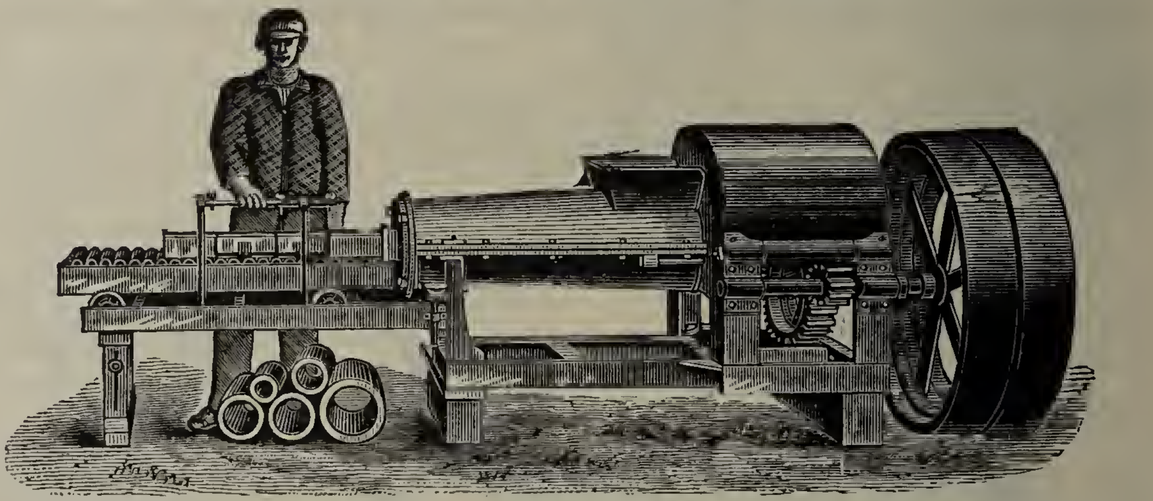
We desire to call the attention of all brickmakers to our PORTABLE BRICK HAKE, which certainly furnishes the cheapest and best means of handling brick from the machine to the yard, and from the yard to the kiln ever yet made use of. By this device the brick when taken from the machine are placed directly upon the haking boards, and when filled the haking boards are taken up by the truck and conveyed to the yard, where they are set down in rows end to end, where they remain until dry, when the truck comes again, picks up the hake of brick and takes it to the kiln. Thus one man does the work of four and the bricks go into the kiln in much better shape by not being handled while they are soft. We have a truck made especially for handling soft molded bricks on pallets. Yard County and State rights for sale. Please address for circulars and for further information,

YANKTON PRESSED BRICK CO.,

Or either of the undersigned, patentees,
M. WALKER, or E. MINER, Yankton Dakota.

KELLS & SON'S IMPROVED Brick and Tile Machines!

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of Brick and different sizes of Tile by changing dies. For strength and durability we except none. We chalenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22, 1880; and February 12, 1884. We can furnish Crushers and also Trucks.

We can produce side cut Brick with our down cut-off, and make perfect edges and corners without the use of water or oil.

We have had Twenty-two Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 18 inches and on our No. 2 Machine we can make tile from 2½ up to 12 inches.

☞ For Illustrated Circulars, Prices, etc., address

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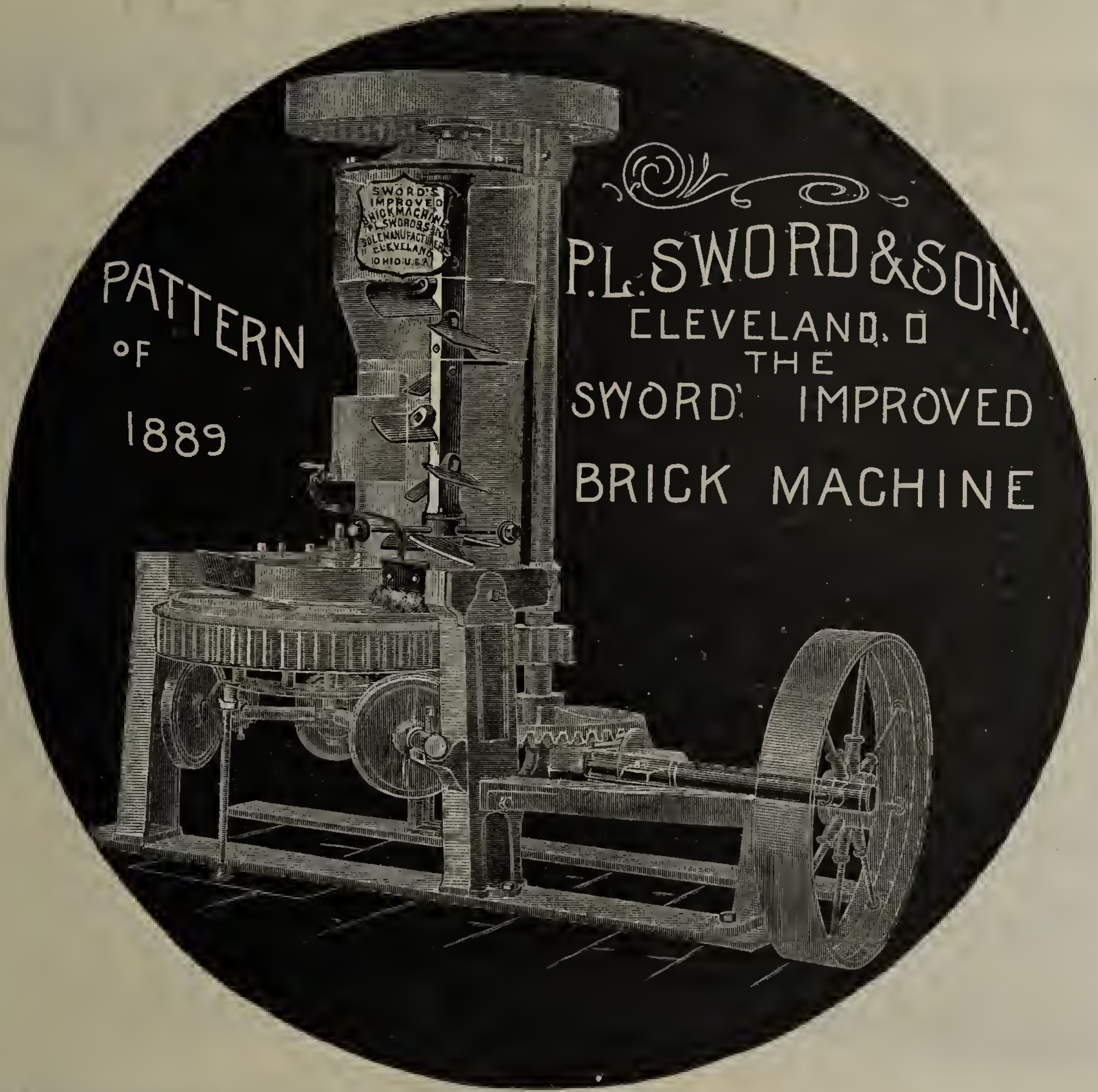
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P. L. SWORD & SON.
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THE
SWORD' IMPROVED
BRICK MACHINE
SWORD'S IMPROVED BRICK MACHINE P. L. SWORD & SON MANUFACTURERS CLEVELAND OHIO U.S.A.

THE PRINCIPAL AND BEST ROUTE
TO THE WEST IS

The Vandalia Line,

And the reason for it being, is apparent to all those who travel between the East and the West. It's trains run solid from Indianapolis to St. Louis, and the service is conceded to be unequalled. Comfortable day coaches, that are kept tidy and clean, handsome and elegantly furnished parlor cars with easy sofa chairs go to make the trip from Indianapolis to St. Louis a pleasure rather than a hardship. Pullman sleeping cars are run on day and night trains, a local sleeper is also run for the convenience of local travel between Indianapolis and St. Louis, and passengers can get into the car at or near the Union Station any time after 8:30 P. M., and will not be disturbed until St. Louis is reached at 7:00 A. M. Rates are always as low as by less important routes. Through express trains run as follows: Leave Indianapolis 7:30 A.M., 11:55 A. M., 11:00 P. M. Arrive St. Louis, 5:00 P. M., 7:30 P. M. and 7:00 A. M., respectively.

Before making arrangements for a western trip, be sure to write or call upon

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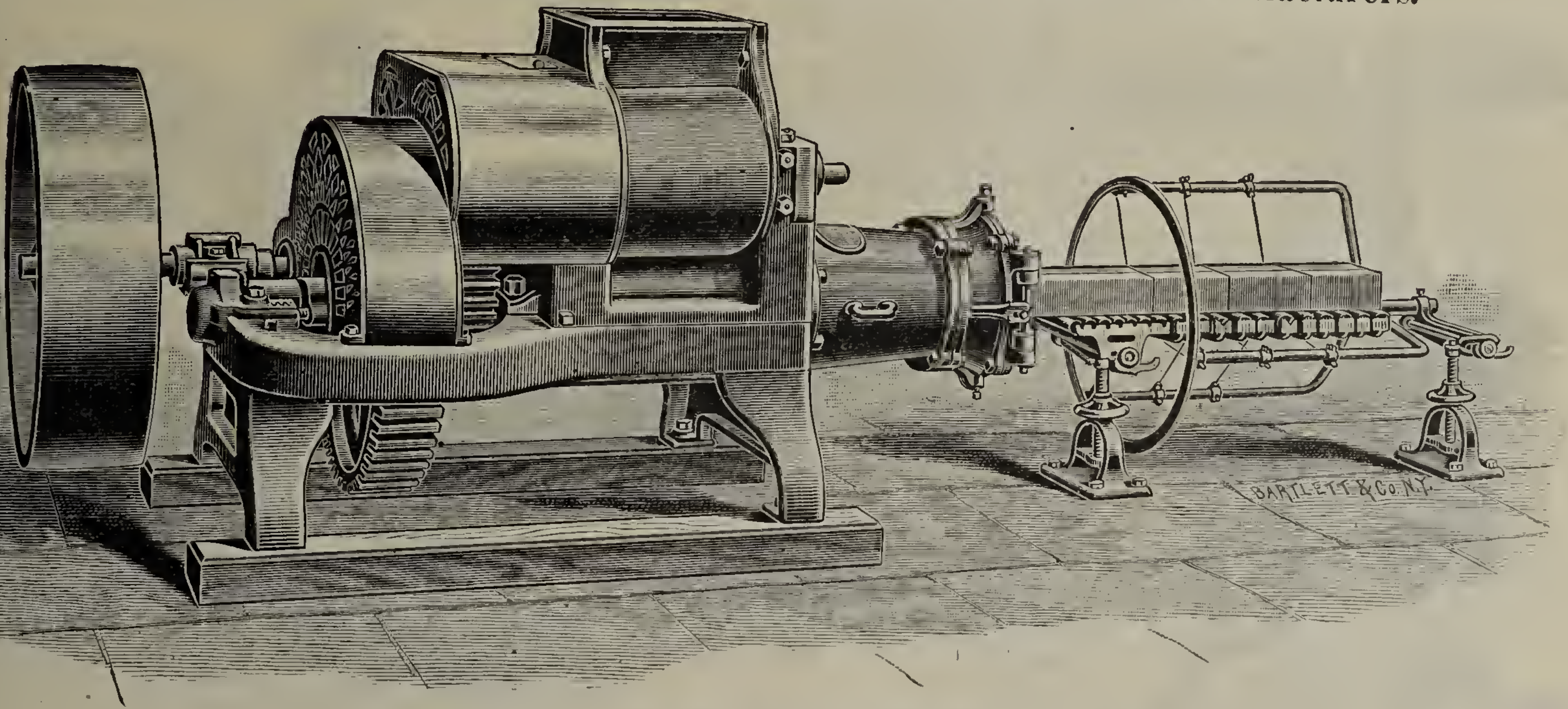
THE OHIO BRICK AND TILE MACHINES.

Now Built in Three Sizes to Meet the Requirements of Different Manufacturers.


BARTLETT & Co. N.Y.

"B" or Medium Size Machine.

Clay Crusher combined with each machine. The A and B sizes of new design, and built with special reference to strength and durability, the heaviest strains being received on wrought iron bars instead of castings. Either size makes end or side-cut brick and tile up to 15 inches. Lubricating brick dies. Cutting tables for both brick and tile superior to all others. Satisfaction guaranteed.

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FATE & FREESE,

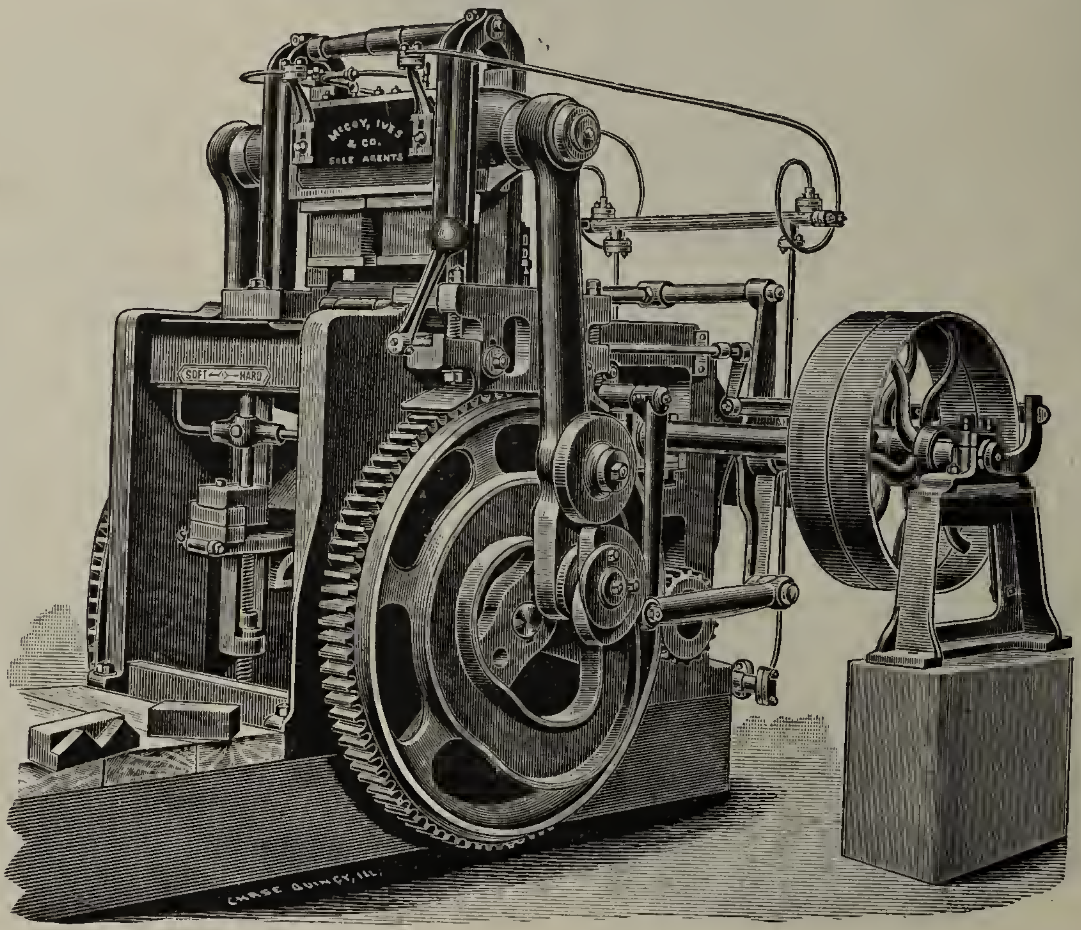
[Mention the Clay-Worker].

PLYMOUTH, Richland County, OHIO.

WHITTAKER'S CELEBRATED
SEMI-DRY BRICK MACHINE

[Patented in U. S. May 13, 1884.]

THE BEST ON EARTH.



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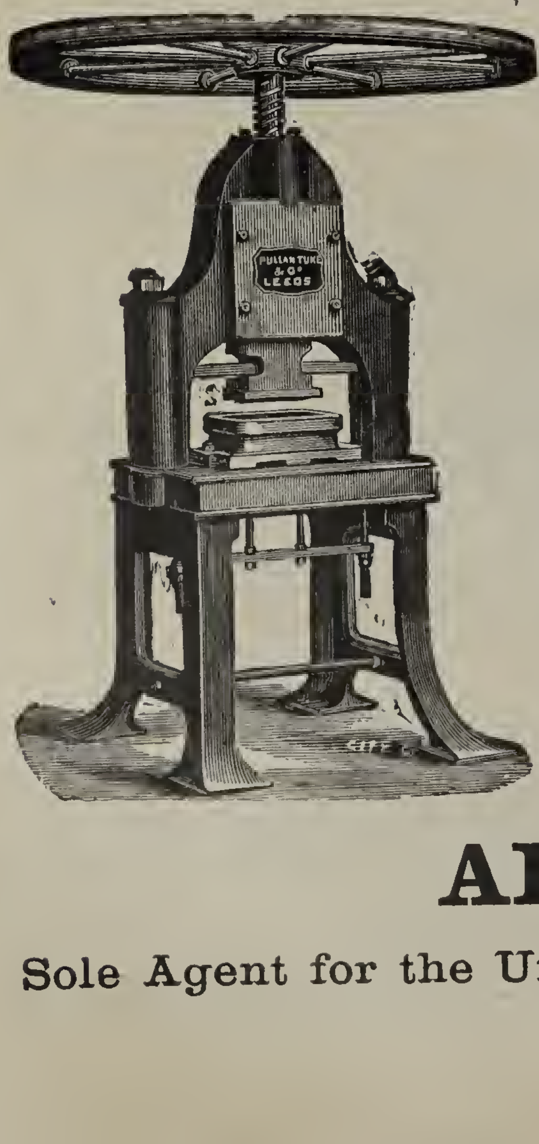
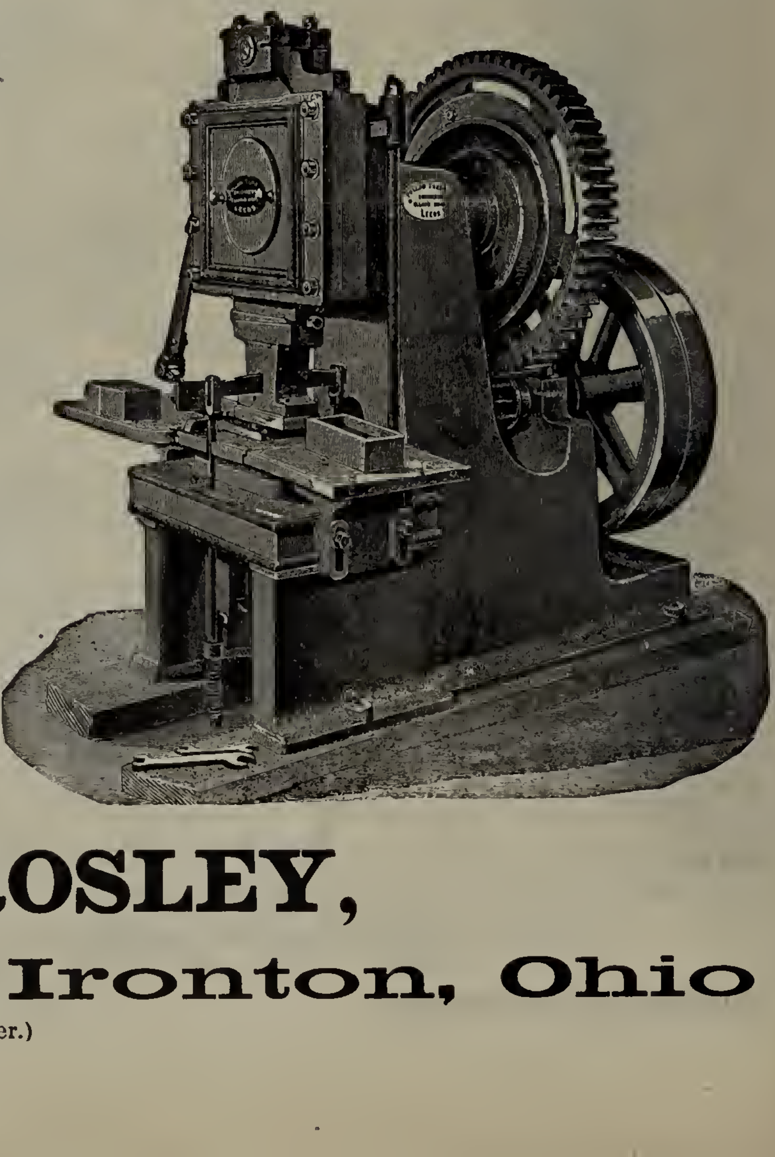
For Circulars and other information address **McCOY, IVES & CO., Quincy, Ills.**

Titley's Patent Screw Press.



Pullan, Tuke & Gill's Patent Steam Press



WE beg to call the attention of Brick, Tile and Terra Cotta Makers to these two Presses as the *Peers of any press on the market* for superiority of finish in the work produced.

The *Steam Press* is best adapted to large works and will produce the best quality of Front Bricks. Its capacity is 10,000 per day of the finest bricks at the smallest cost for labor. For small works and for all makers of moulded and ornamental bricks, tiles and terra cotta, we recommend the *Screw Press*. It will exert a pressure of 30 tons and is to-day *without a rival* a the *best press on the market*. Its capacity is 3,000 to 4,000 plain brick per day.

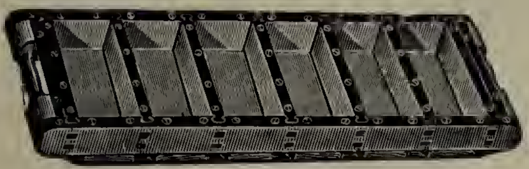
Send for circulars giving all information, with testimonials.

ALFRED CROSLEY,

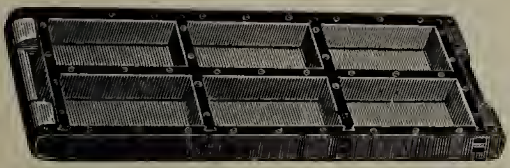
Sole Agent for the United States. **Ironton, Ohio**

(Mention the Clay-Worker.)

6 B. MACHINE MOULD.



6 B. HAND MOULD.



3 B. HAND MOULD.

D. J. C. ARNOLD,

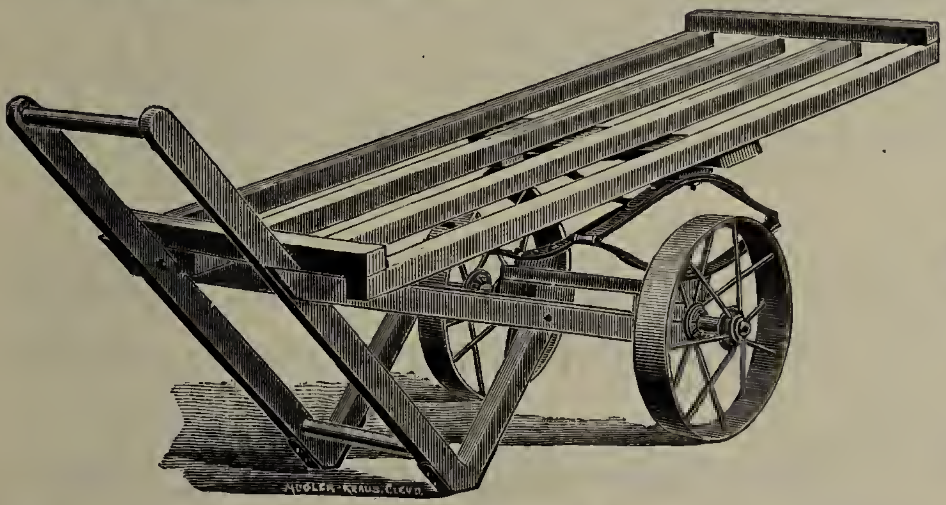
MAKES ∴ BRICK ∴ YARD ∴ SUPPLIES

At NEW LONDON, OHIO.

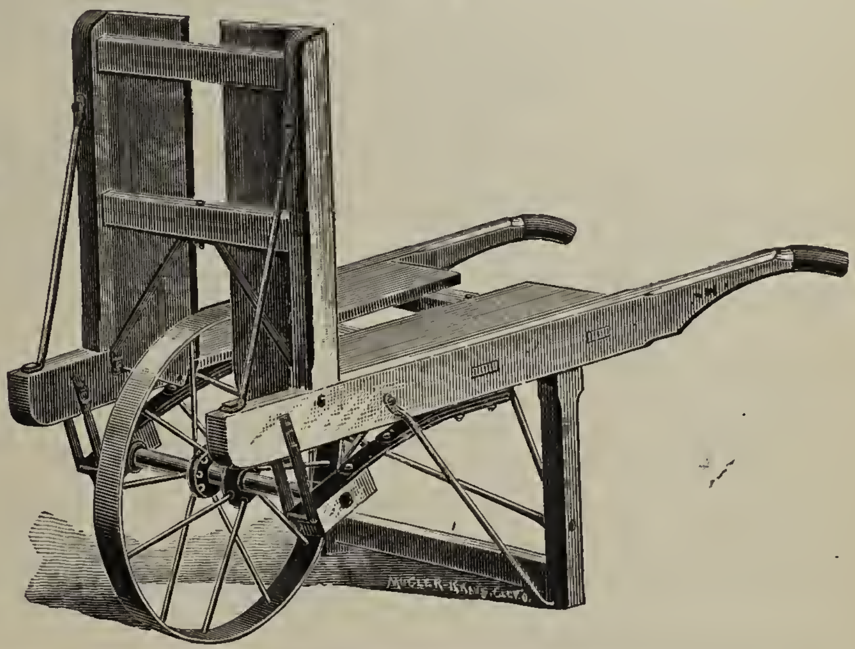
Get his prices before you buy. **All goods first-class in every respect.**

[Mention the Clay-Worker.]

☞**Catalogue sent on application.**



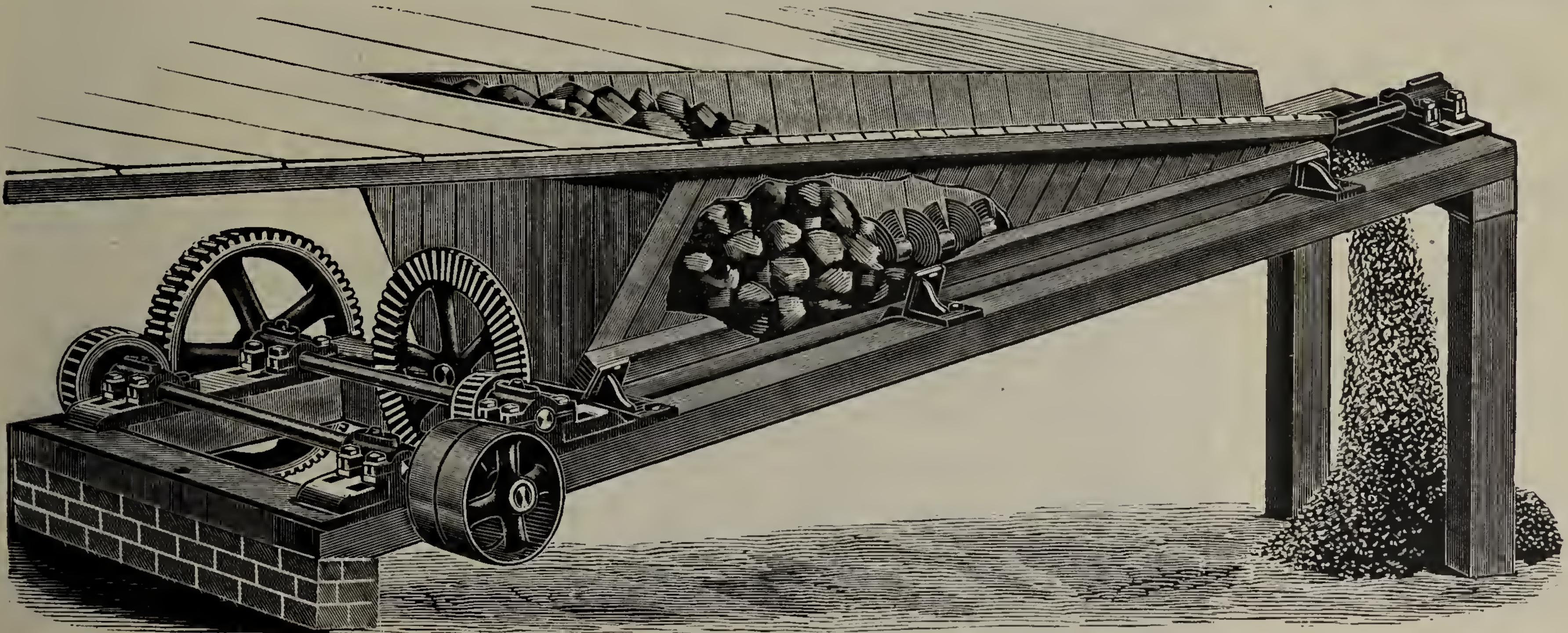
NO. 10 SPRING TRUCK.
(Weight 100 pounds.)



NO. 1 BRICK BARROW.
(Weight with springs 100 lbs.)

Emen's Patent Perfection Clay Granulator and Feeder.

SOLD SUBJECT TO TRIAL AND APPROVAL.



Saves time and labor and produces better ware; simple in construction; rapid and accurate in operation. Every brick, tile and sewer pipe manufacturer should investigate the merits of this machine.

During the past season it was introduced in several of the leading Chicago brickyards and is now at work giving entire satisfaction. Write for descriptive circulars.

Chambers Brothers Company, of Philadelphia, Pa., are licensed to manufacture and sell these machines.

EMENS AND COLE

[Mention Clay-Worker.] HOLTON, (MUSKEGON CO.) MICH.

THE STANDARD BRICK MACHINES

—MANUFACTURED BY—

A. M. & W. H. WILES,

Grassy Point, Rockland County, New York.

These Moulding Machines have been in constant use for over 30 years, and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

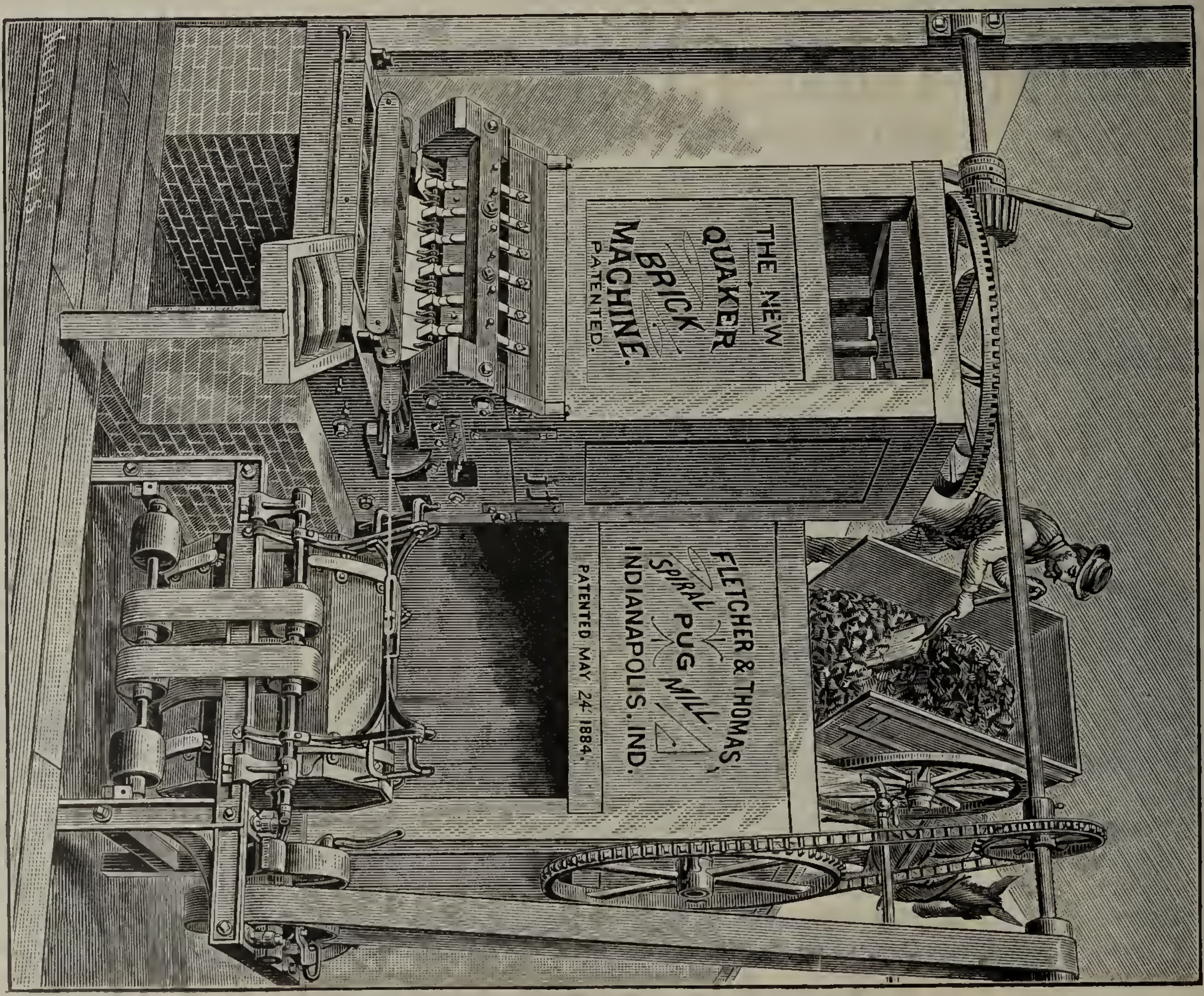
Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

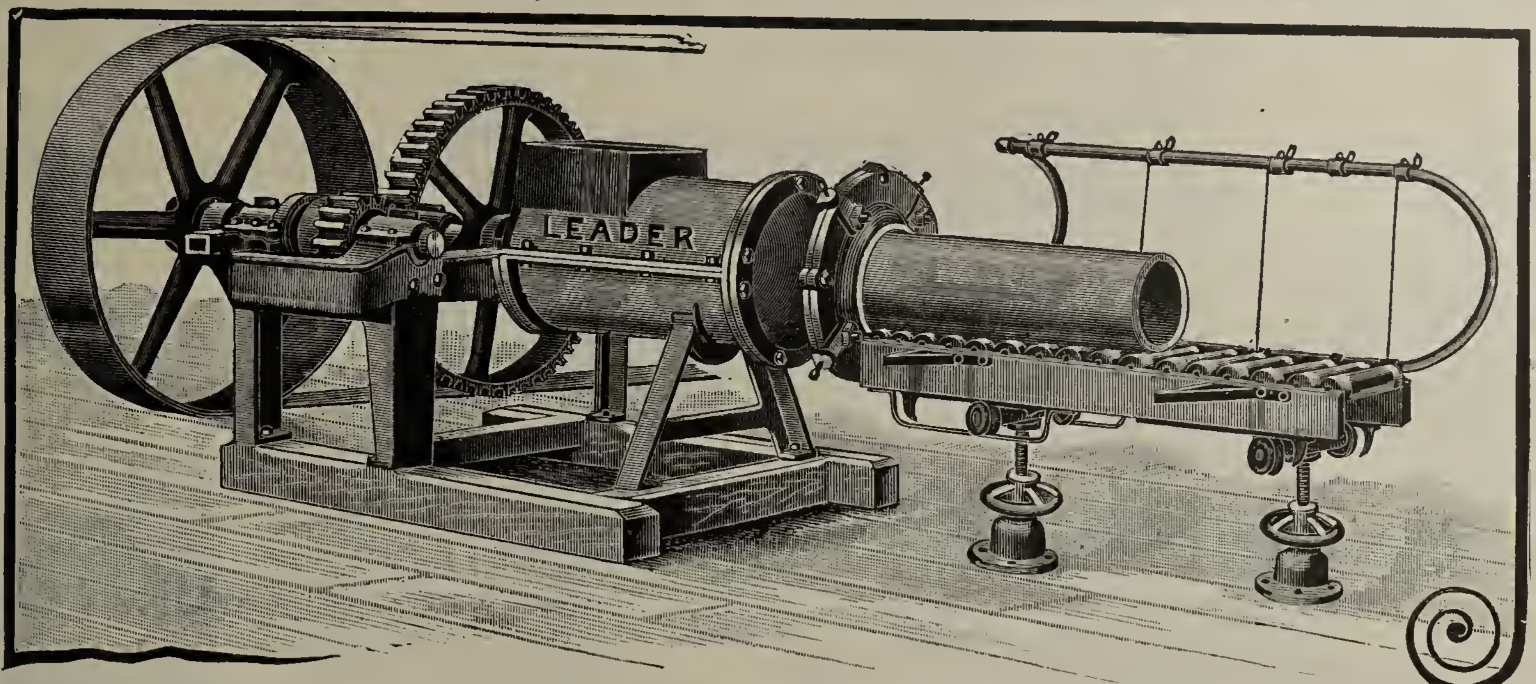
CORRESPONDENCE SOLICITED.

This outfit will make the largest number of the very best of Pallet Bricks at LeastCost of anything in the market. For further particulars address


THE NEW QUAKER BRICK MACHINE. PATENTED.
FLETCHER & THOMAS' SPIRAL PUG MILL INDIANAPOLIS, IND.
PATENTED MAY 24 1884.

BENNETT BROS. & CO., Wellington, Lorain Co., Ohio.

THE LEADER BRICK AND TILE MACHINE.



We manufacture the very latest and best designs of Tile Machines, Brick Machines, Clay Crushers, Elevators, and Dump Cars for handling clay by steam. Design special clay-working machinery to order. Have a large stock of the best cutting wire. Correspondence solicited.

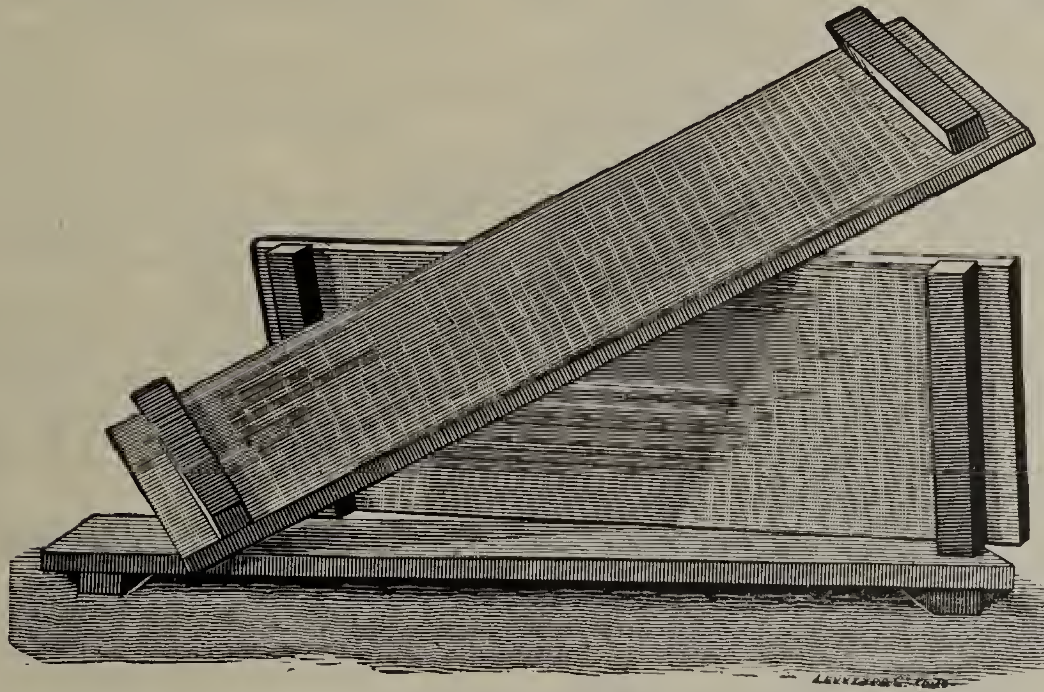
BROWN & HARROP MFG. CO.,

Geo. S. Pollock, Agent, Sullivan Ind

PORTLAND, IND.

BRICK PALLETS.

Brick Pallets.



Brick Pallets.

PIPE BOARDS, ROOFING LUMBER Supplied Direct in Carload Lots.

When writing for prices, give an exact description of the kind of pallet wanted, as different pallets are in use in different sections of the country. State whether cleats are to be nailed on; also length, width and thickness of the pallet. We have a big trade in this line and can save you one profit. Write for prices.

W. B. MERSHON & CO.,

Manufacturers of all kinds of white pine lumber and
packing boxes in shooks.

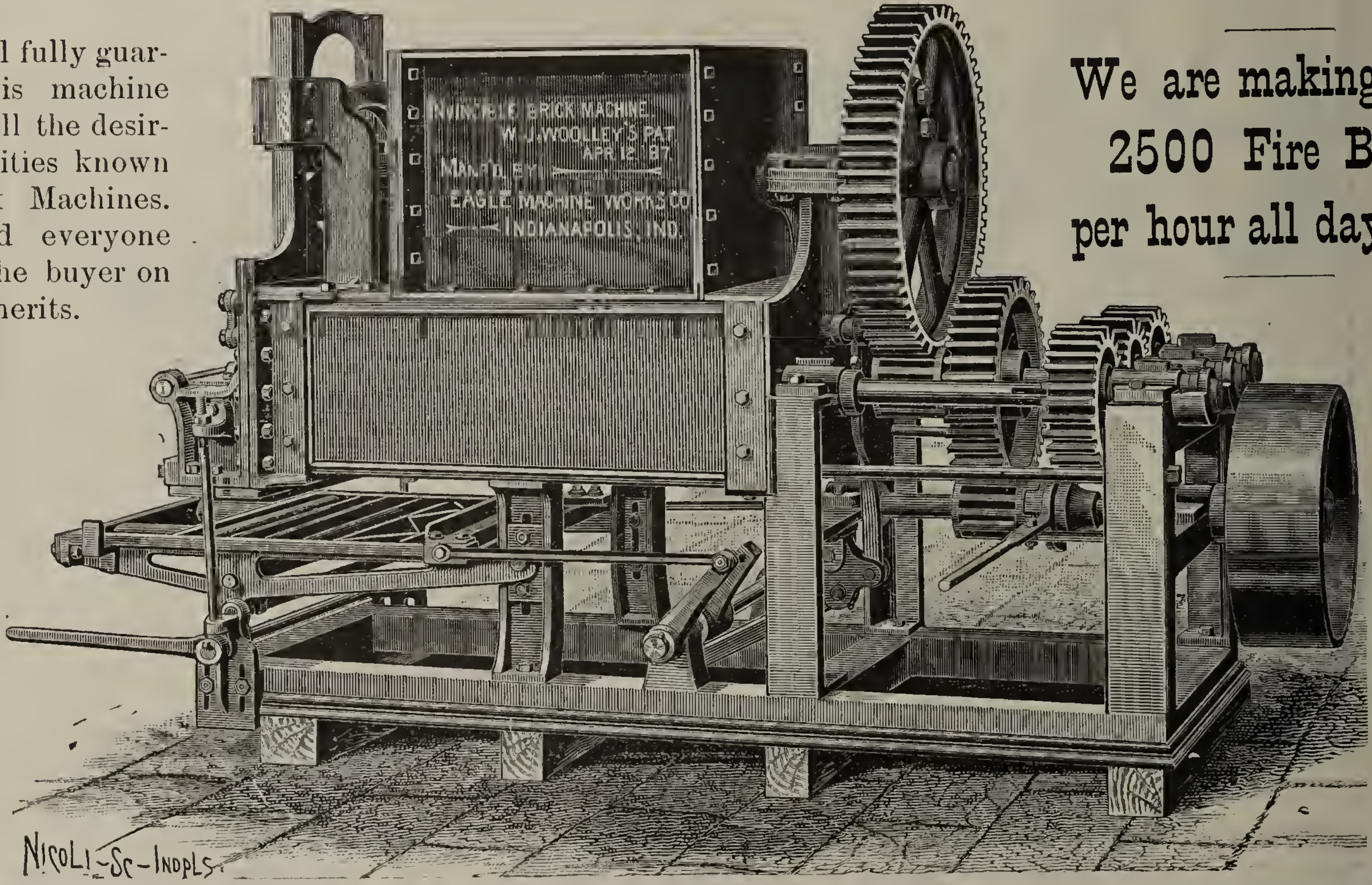
East Saginaw, Mich.

The Invincible Brick Machine.

The STRONGEST, MOST DURABLE and BEST BRICK MACHINE in the market. Write for full description, prices, etc., to

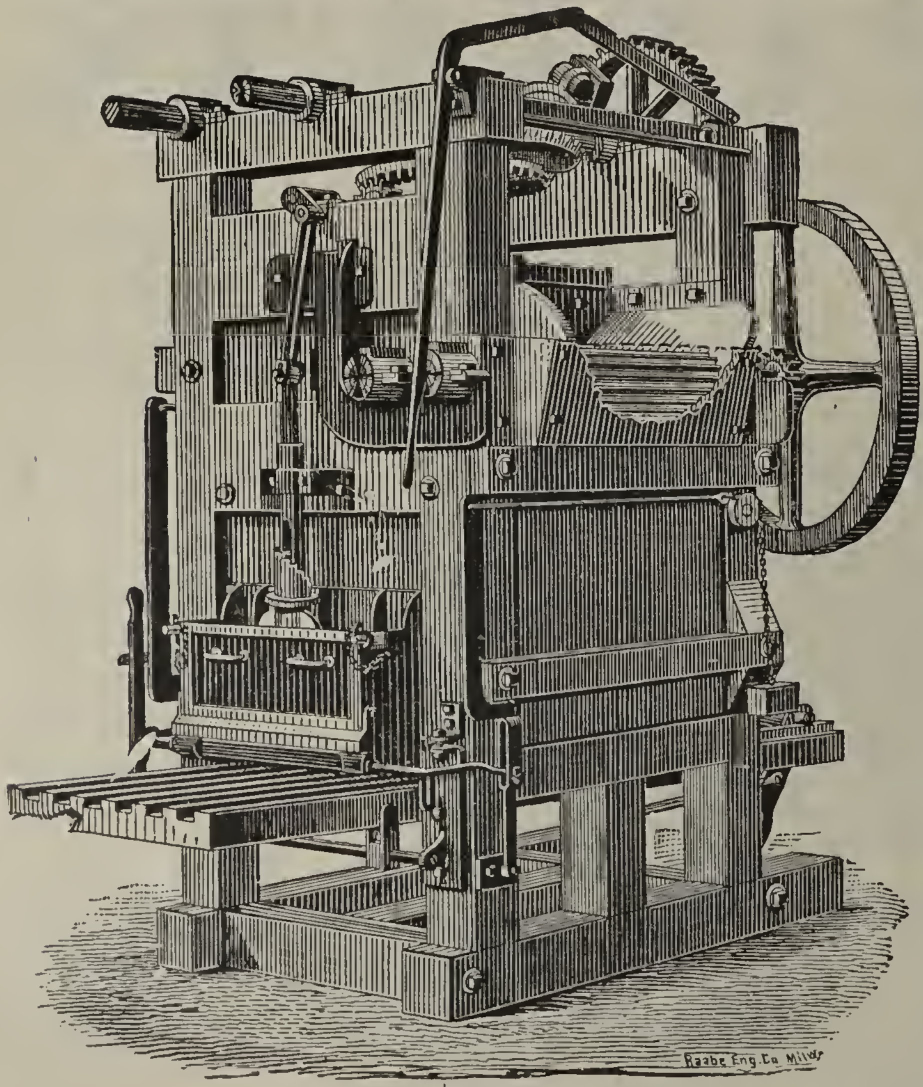
EAGLE MACHINE WORKS CO., Indianapolis, Ind.

We will fully guarantee this machine to have all the desirable qualities known in Brick Machines. Each and everyone put to the buyer on its own merits.



We are making ver 2500 Fire Brick per hour all day long.

Nothing Equals It.



GURNEY BRICK MACHINE WORKS,

MILWAUKEE, WISCONSIN,

Manufacturers of

THE GURNEY BRICK MACHINE

—Having Crushers Inside of Pug Mill.—

THIS is the only Machine in use which has the *combination of Crushers, Mixing and Moulding Apparatus* in a single machine. The arrangement is covered by patent issued October 6, 1885.

This machine will work any clay, however hard and lumpy, with no preparation before soaking in the usual way.

The Crushers will take the clay through as fast as the machine will turn out the brick, *doing entirely away with lumps*, which brickmakers know have been much in the way of making good brick, and also have caused great loss by breakage.

The Machine will turn out four thousand, or more, good, smooth, square brick an hour. With proper moulding sand THE BRICK FROM THIS MACHINE, *made from any clay*, WILL SLIP EASILY. The Machine has been thoroughly tried in different parts of the country.

Also First-Class STEAM and HORSE-POWER MACHINES of same pattern, without Crushers.

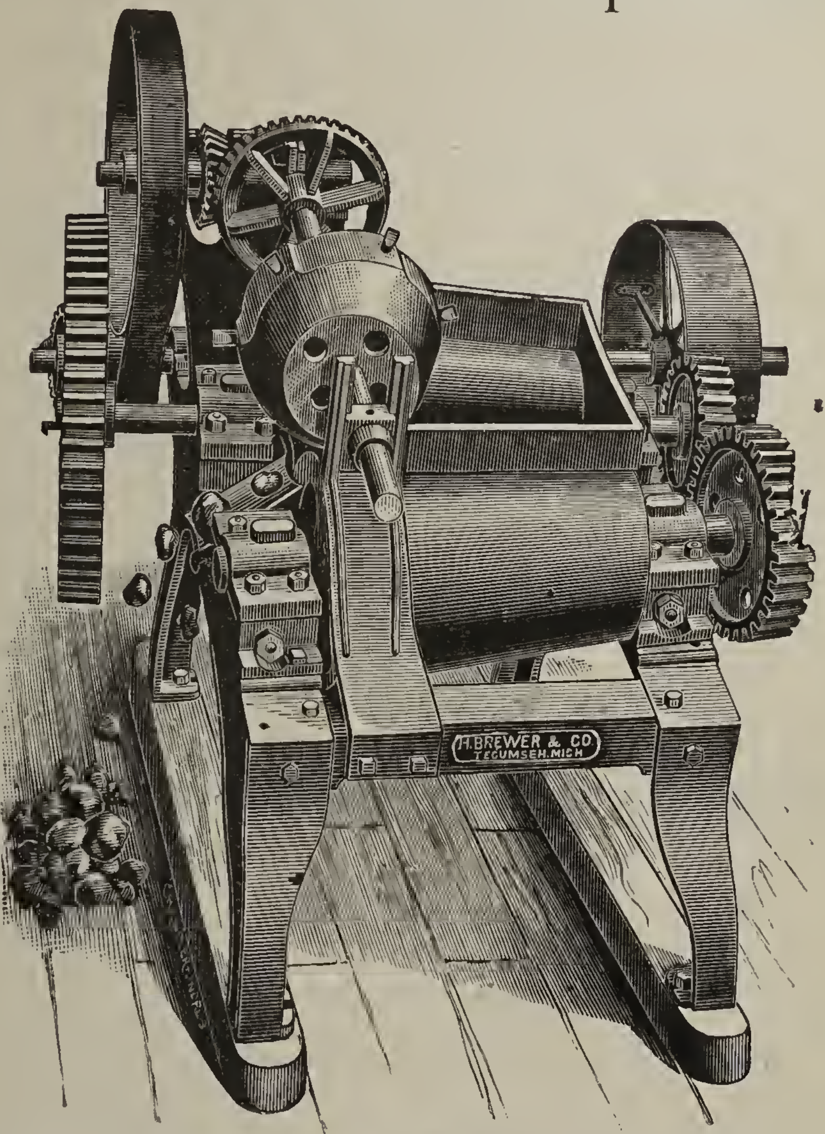
For further information and Illustrated Catalogue address—

T. C. GURNEY,

100 Wisconsin St., MILWAUKEE, WIS.

H. Brewer & Co's. Clay Crusher and Stone Separator.

The prominent feature in this Crusher is the combination of two smooth, tapering crushing rolls, running at different speeds, in connection with an adjustable transverse roll which is of irregular form and provided with teeth or spurs, whereby the clay is rapidly broken up and crushed, and the stones separated therefrom.



TESTIMONIALS.

Saunemin, Ills., May 18th, 1888.

H. Brewer & Co., Gentlemen—Your Crusher works to a charm and we are very highly pleased with it. It runs one-half easier than any other Crusher we have had.

Yours Truly,
SAUNEMIN BRICK AND TILE CO.

Budd, Ills., May 3d, 1888.

H. Brewer & Co., Dear Sirs—The Crusher and Elevator work to my entire satisfaction. I feel confident I would be $2,000 ahead, to-day, had I put in your Machine and Crusher at the start.

Yours Truly,
HENRY SIEDENTOP.

Monroe, Iowa, May 15th, 1888.

H. Brewer & Co., Gentlemen—The Crusher is giving good satisfaction and I think will do all that is claimed for it.

Yours,
T. P. BURCHINAL.

☞Do not fail to obtain our prices on Tile Machines, Brick Machines, Pug Mills, Clay Crushers, etc. For illustrated Catalogues and Price List, address

H. BREWER & CO.,

(Mention Clay-Worker.) **Tecumseh, Mich.**

STEDMAN'S IMPROVED

Disintegrator and Pulverizer.

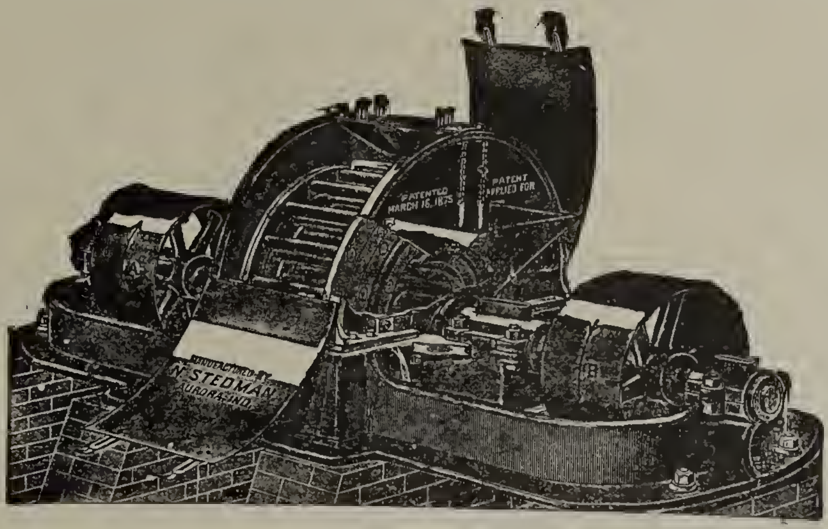
This mill will disintegrate or pulverize the following materials:

Clays of all kinds, Shale and Slate direct from the bank, for Brick and Tile.

Fire Clay and Sand Stone Rock—for Cement and Fire Brick.

Iron Ores of various kinds, Guano, Phosphates, Bones—green, dry steamed, Tankage, Bone-Ash, Salt Cake, Soda, Cracklings, Oyster Shells, Animal Matter in almost all conditions, Old Fire Brick and Tiles.

Old Pottery Ware, Plastic Clay, Asbestos, and in fact almost any material that can be disintegrated.



A good Disintegrator and Pulverizer is a long felt want in many branches of business. This Mill is an improvement over any yet made and is the result of practical experience.

This Mill is made in three sizes: 34, 40 and 48 inches. The capacity for clay is as follows:

34 inch Mill will pulverize for from 15,000 to 25,000 brick per day.

40 inch Mill will pulverize for from 20,000 to 35,000 brick per day.

48 inch Mill will pulverize for from 75,000 to 100,000 brick per day.

To Brick, Tile and Pottery Men and to Terra Cotta Works this Mill is invaluable. It reduces the clay to a fine, light and soft condition, with its full adhesive properties retained.

For Prices and any other Information, Address

Stedman's Foundry and Machine Works,

PROTECTED BY PATENTS.
[Mention the Clay-Worker.]

AURORA, IND.

ATTENTION, TILE-MAKERS.

Such improvements have lately been made in the production of Porous Earthenwares that the power and facilities usually afforded by the common drain tile manufactory will enable a manufacturer to step into a new and profitable business, protected from competition, at an outlay not exceeding that already invested in his plant, by more than One Thousand Dollars.

Shop rights or Territorial rights upon a royalty basis supplied by

The International Terra-Cotta Lumber Co.,

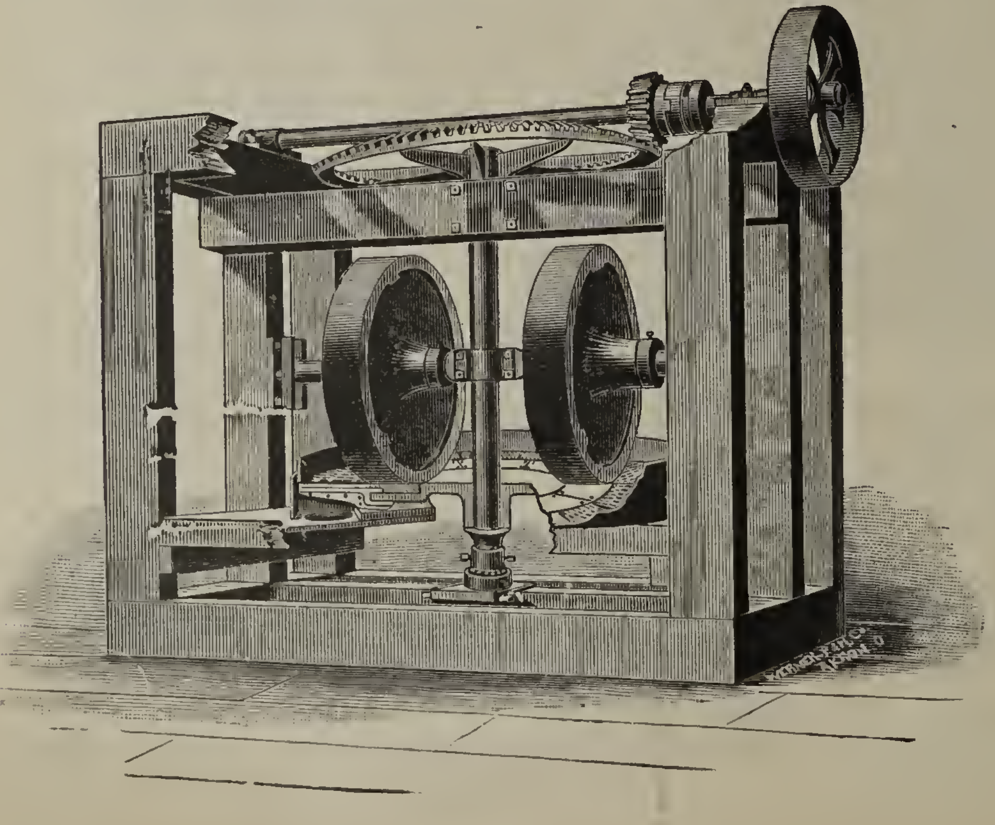
115 DEARBORN STREET, CHICAGO, ILLS.,

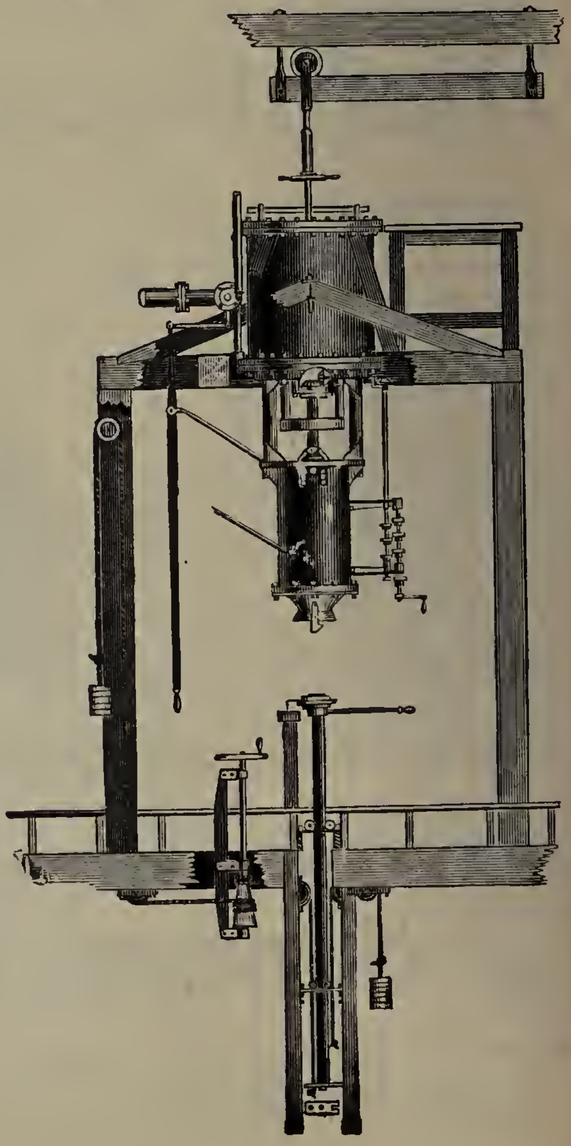
to whom all applications and correspondence should be addressed.

TAPLIN, RICE & CO.,

AKRON, O.

Manufacturers of Improved Clay Working Machinery of all kinds, such as Clay Mills, Dry and Wet Pans, the Barber Steam Sewer Pipe Press, Dies, Clay Blockers, Potters' Wheels and machinery of every description. Write for circulars.

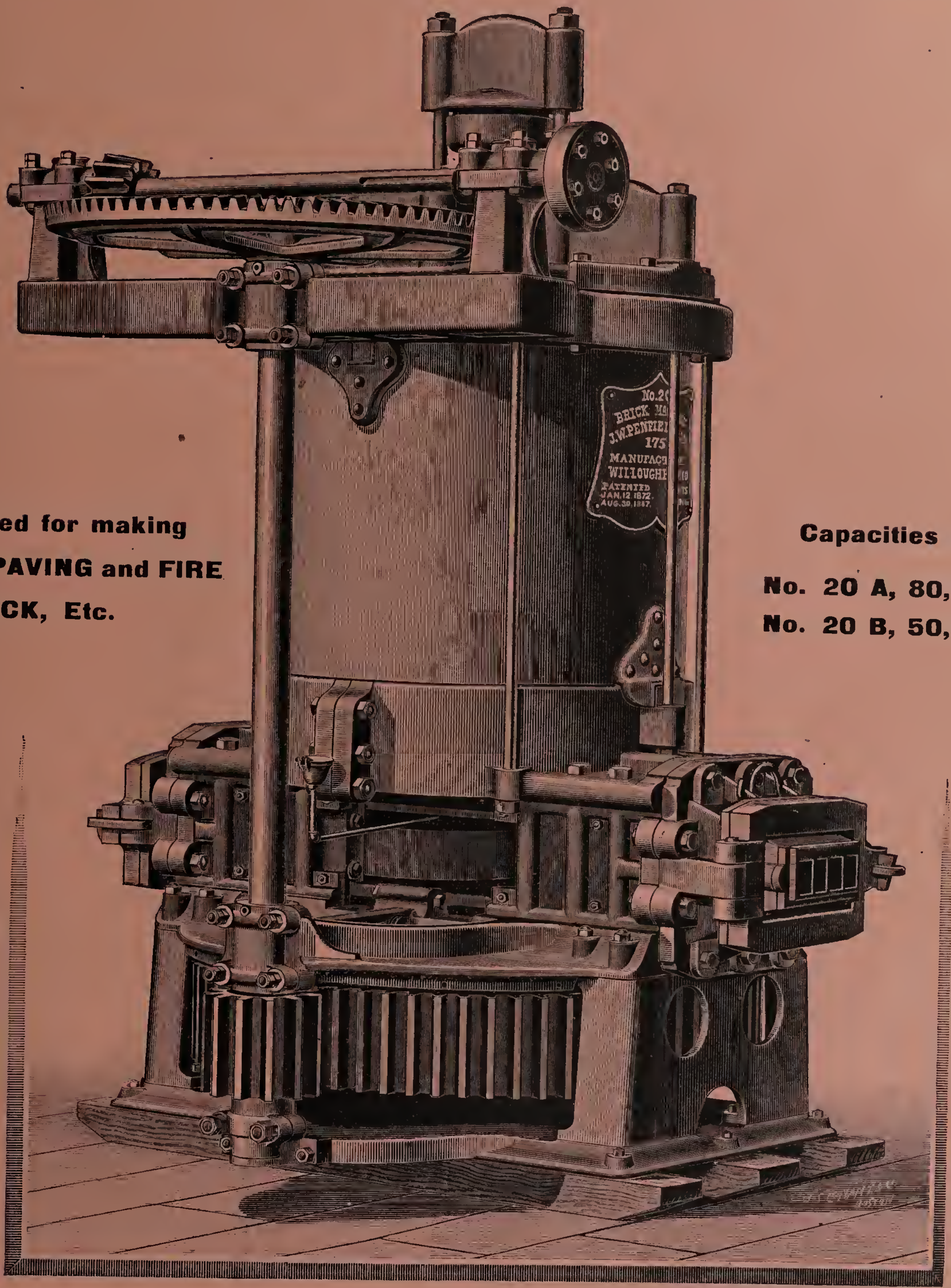




THE PENFIELD BRICK MACHINES

No. 20, A. & B.

The -:- Largest, -:- Strongest, -:- and -:- Best -:- Brick -:- Machines -:- Made.



Unexcelled for making
COMMON, PAVING and FIRE
BRICK, Etc.

Capacities per day:

No. 20 A, 80,000 Brick.
No. 20 B, 50,000 Brick.

—WE MANUFACTURE—

Brick Machines; Tile Machines; Pug Mills; Clay Crushers and Stone Separators; Granulators; Elevators; Kiln Castings; Yard Supplies. Pulleys, Shafting, Hangers, Couplings, Etc., Etc.

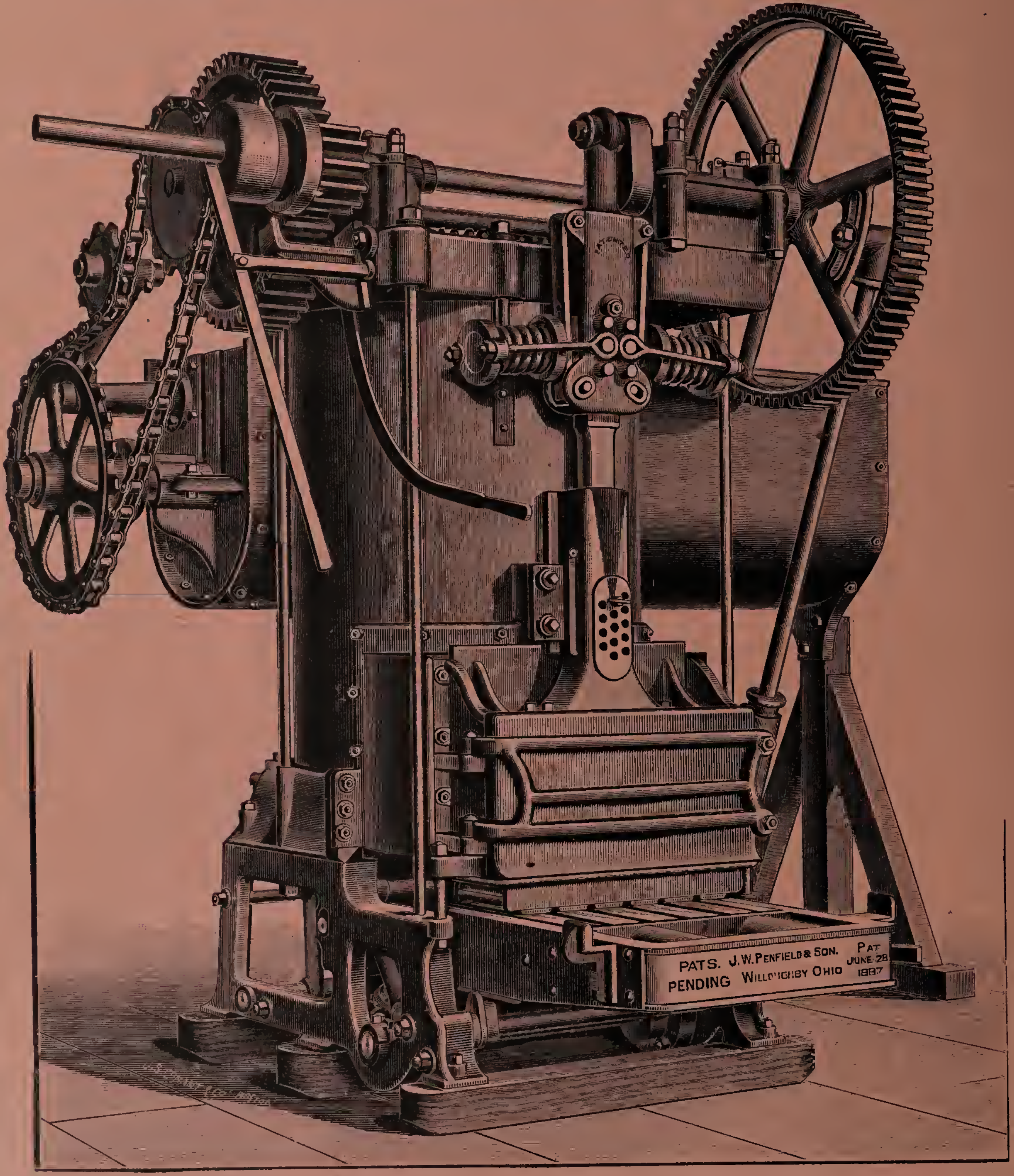
☞ *Complete Outfits* of any desired capacity a specialty. For full particulars address the manufacturers,

J. W. PENFIELD & SON, - - Willoughby, Ohio, U. S. A.

THE PENFIELD
Upright Stock Brick Machine.

WITH DIRECT-ATTACHED PUG MILL.

Every Brickmaker should send for full particulars of this machine.



This Machine is furnished with or without pug mill, as desired.

The Strongest, Most Practical and BEST Sand Moulding Machine made.

All Iron and Steeel; No wooden parts to decay; Extremely heavy; Perfectly rigid; Light running; Has separate gearing for doing the pressing and pugging; Makes **six** of the largest sized brick in each mould.

All the brick are perfect in shape, with good sharp corners, in fact **perfect stock brick.**

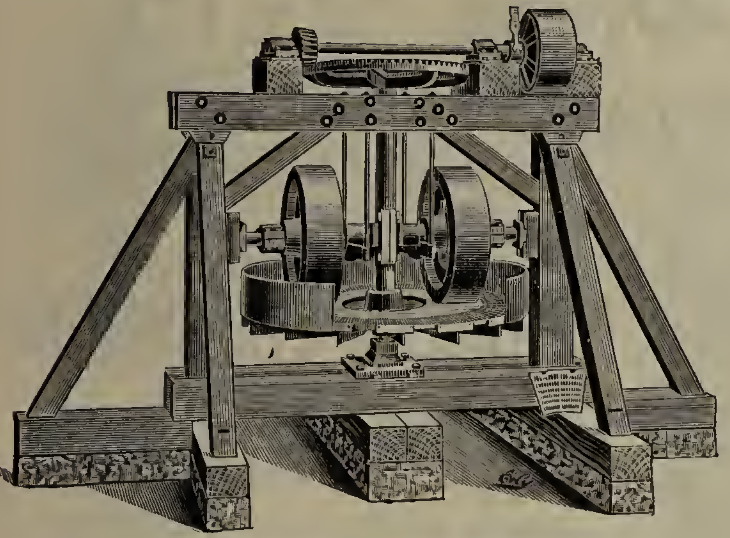
All the brick are of equal density, and if repressed will make first-class pressed brick, **ALL UNIFORM IN SIZE.** Address the Manufacturers,

J. W. PENFIELD & SON,

[Mention the Clay-Worker.]

WILLOUGHBY, OHIO, U. S. A.

THE FROST
Dry & Wet-Pan Crushers, Chasers, Etc.,



—FOR—

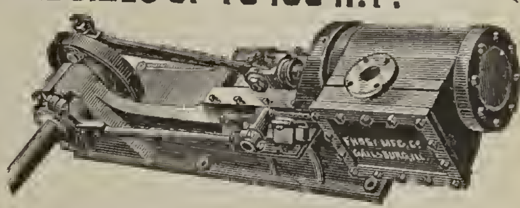
BRICK, TERRA-COTTA,
SEWER PIPE AND
FIRE CLAY.

—o—

The best and cheapest machines made for working hard clay, soap stone, grog, etc.

Write for prices and other information.

The Frost Engine Co.
GALESBURG, ILL.
ALL SIZES UP TO 150 H. P.



ELEVATOR SUPPLIES
PULLEYS, SHAFTING, SPROCKETS, BUCKETS, BELTING, SHELLERS, CLEANERS, MILLS. &c.
SEND FOR CATALOGUES

ESTABLISHED 1812,
AND CONTINUED ON THE SAME PREMISES EVER SINCE.

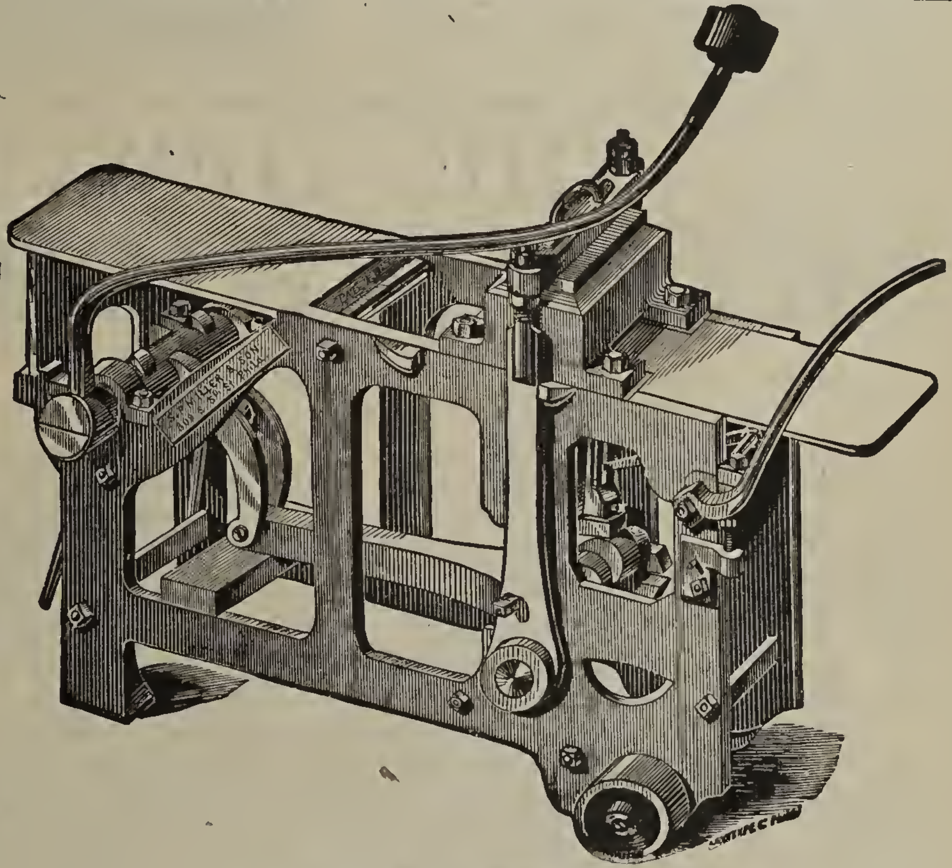
MILLER'S
BRICK PRESSES,
Introduced 1844 Latest Improved Patents, Aug. 28, 1883.

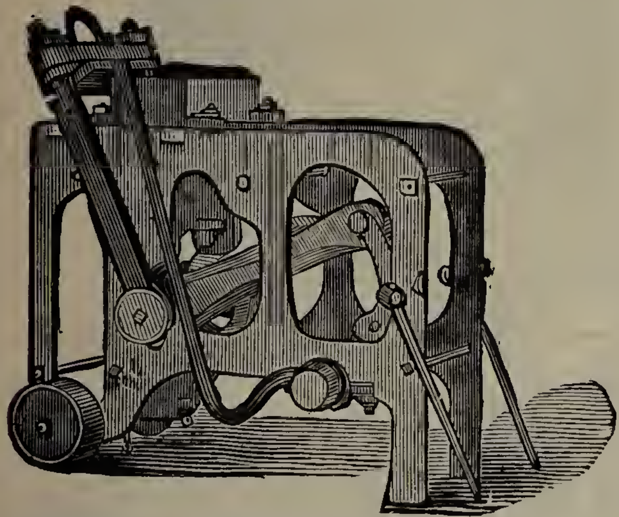
SAMUEL P. MILLER & SON,
MAUFACTURERS OF
RED AND FIRE BRICK PRESSES,
Of five different styles, embodying all the improvements in Hand Brick Presses in use.

Clay Wheels with Reciprocating Rack, Kiln Castings, Brick Moulds, Clay Spades, and the Tools in General Use for Brick Making.

No. 309 SOUTH FIFTH ST., PHILADELPHIA, PA.

S. P. M. & Son refer to Brickmakers generally. ☞ Orders from abroad promptly attended to.





RED BRICK PRESS.

GEORGE CARNELL,
Nos. 1819 and 1821 Germantown Avenue,
and Fifth St.,
PHILADELPHIA, PA.
☞ Send for Circular and Price-List.

Philadelphia Brick Machine Works
—MANUFACTURER OF—
FIRE AND RED BRICK PRESSES.
Various sizes, from the smallest size up to 24 inches; also, manufacturer of **Clay Mills, Tempering Machinery,** and all kinds of **Brickmakers' Tools.**

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and is fitted up ten per cent. cheaper. ☞ Mention THE CLAY WORKER.

The Great I.B.&W. Route

THE SHORT LINE
Both East and West

The only line with solid trains to Bloomington and Peoria with Through Cars to principal Missouri River points in several hours less time than any other line. Also through Sleeping and Reclining Chair Cars via Danville to Chicago, making as quick time at lower rates than any other route. The short line to Springfield, Columbus, Ohio, and all points in Southern and Eastern Ohio. The Quickest and Only Route with Through Chair Cars to Urbana, Ohio, Bellefontaine, Kenton, Tiffin and Sandusky. The authorized differential route East with Quick Time and Through Tickets to Principal Eastern Cities from $1.00 to $1.50 less than regular rates. Trains at Indianapolis Union Station

Leave { Going East *4 00 am. 3 00 pm.
Leave { " West 7 45 am. 12 05 pm. *11 15 pm. 5 50 pm
Arrive { From East 11 45 am *10 50 pm.
Arrive { " West *3 40 am. 2 40 pm. *6 30 pm. 10 15am
*Daily.

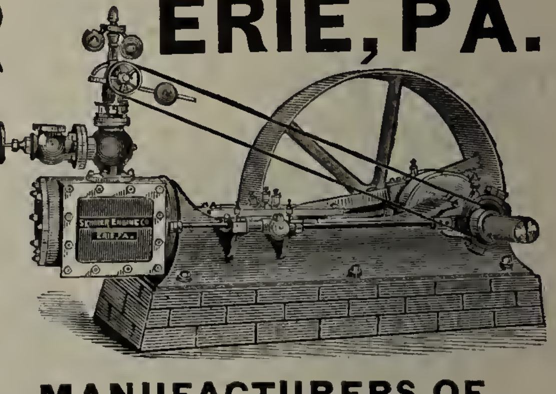
All trains have the finest of Buffet Sleepers and Reclining Chair Cars. For tickets and full information, apply to Geo. Butler, Gen'l Agent at the Union Station, 42 and 44 Jackson Place (opposite main entrance Union Station) Indianapolis, or to any Agent on the line.

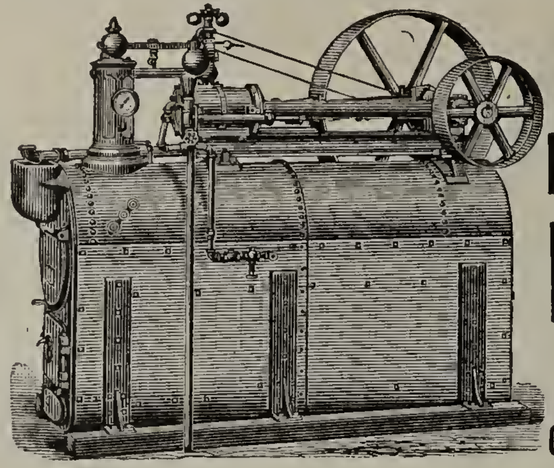
Look in local columns for special notices of excursions, reduced rates, etc.

H. M. BRONSON, Gen'l Pass. and Ticket Agent.
B. C. KELSEY, Ass't Gen'l Pass. Agent, Indianapolis

SKINNER ENGINE CO. **ERIE, PA.**

OVER 3400 IN USE





MANUFACTURERS OF
PORTABLE AND STATIONARY
Engines AND Boilers
SEND FOR CATALOGUE.
NEW YORK AND NEW ENGLAND OFFICE:
C. R. VINCENT & CO. 15 Cortlandt St. NEW YORK.

THE NEW IMPROVED
CHIEF BRICK MACHINE.

Patented Jan. 1, 1884, *April* 2, 1884, *and the new improvements of* 1887 *and* 1889.

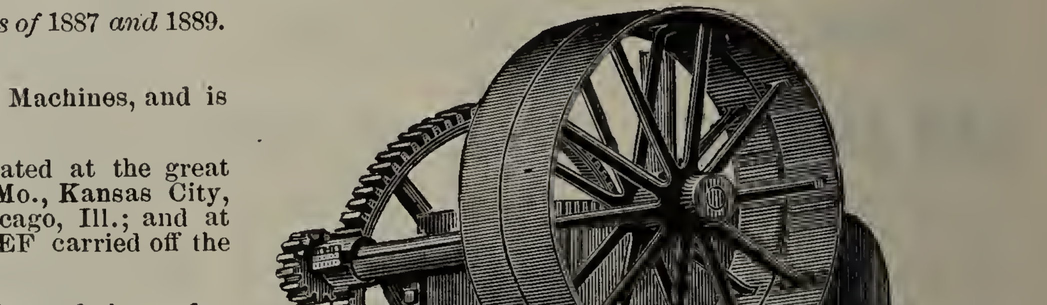
Has taken the lead and stands at the head of all Brick Machines, and is now in operation in every State and Territory in the Union.

In its original construction it was exhibited and operated at the great Southern Exposition at Louisville, Ky.; also at St. Louis, Mo., Kansas City, Mo.; Indianapolis, Ind.; Columbus, O.; Cincinnati, O.; Chicago, Ill.; and at each and all places where premiums were awarded the CHIEF carried off the first prize medal over all competitors.

And with the late new improvements added the CHIEF stands in perfection, at the head of human inventions.

The NEW IMPROVED CHIEF is wonderful in operation, is all steel and iron, and of the greatest strength and durability, is easily operated, and with two horses or a small engine makes 60 to 100 perfect bricks per minute. Grinds, tempers and at the same time moulds into brick any clay. Stones in clay cannot break it, nor interfere with its free operation. It is easily transported, and changed from horse to steam power. It fills the moulds evenly and well until the machine is empty of clay, pressing each brick equally and solid, so all will shrink alike. The pressure can quickly be changed while the machine is running to suit the consistency of the clay. All shafts are of steel; main shaft runs in three boxes or bearings all outside of the machine into which mud or sand cannot penetrate. The wear can at all times be taken up so as to prevent leakage. The clay in the press box is under full control of the plunger, which is direct and positive, and prevents the mud from floating back into the mud drum; this feature is not found in any other mud machine.

Bricks made by the NEW IMPROVED CHIEF, are solid and perfect, and have sharp edges and corners, and do not crumble in burning.



The NEW IMPROVED CHIEF is equally suitable either for small or large yards, the best of bricks are made by it at the least labor and expense, all parts are easy of access and the bearings can be oiled from the outside. All ordinary sizes of brick as well as ornamental brick can be made on the NEW IMPROVED CHIEF and it is especially adapted to making fire brick of any shape with the least danger of breakage and the smallest per cent of lost brick.

The NEW IMPROVED CHIEF is sold on its merits, and warranted to be all that is claimed for it

We will send Circulars and Testimonials of the NEW IMPROVED CHIEF BRICK MACHINE, New Departure Tile Machine, Engines, Etc., Etc., free to any address on application. Address

Anderson Foundry & Machine Works,
Anderson, Indiana.

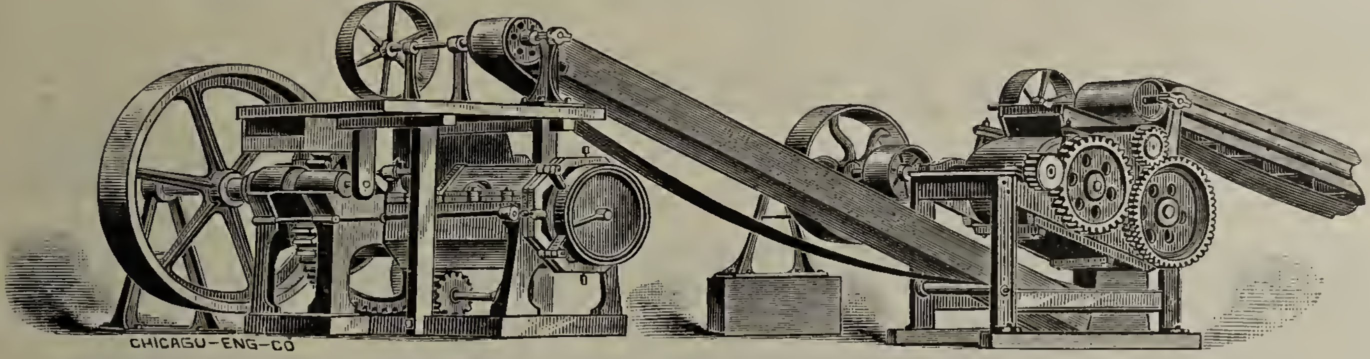
[Mention the Clay-Worker.

Adrian Brick and Tile Machine Co., Adrian, Mich.,

—MANUFACTURERS OF—

Brick and Tile Machinery,

Clay Crushers,
Engines
and Boilers.



Also Daso's Builders' and Contractors' Elevators. Steam Fittings and Iron and Brass Castings Furnished to Order.

The working qualities of our machinery at its present state of development as estimated by one of the prominent Brick Manufacturing Companies of Kansas City, are stated in the following reply to a letter of inquiry addressed to them:

JOHN GIBSON, Esq., Monticello, Iowa:

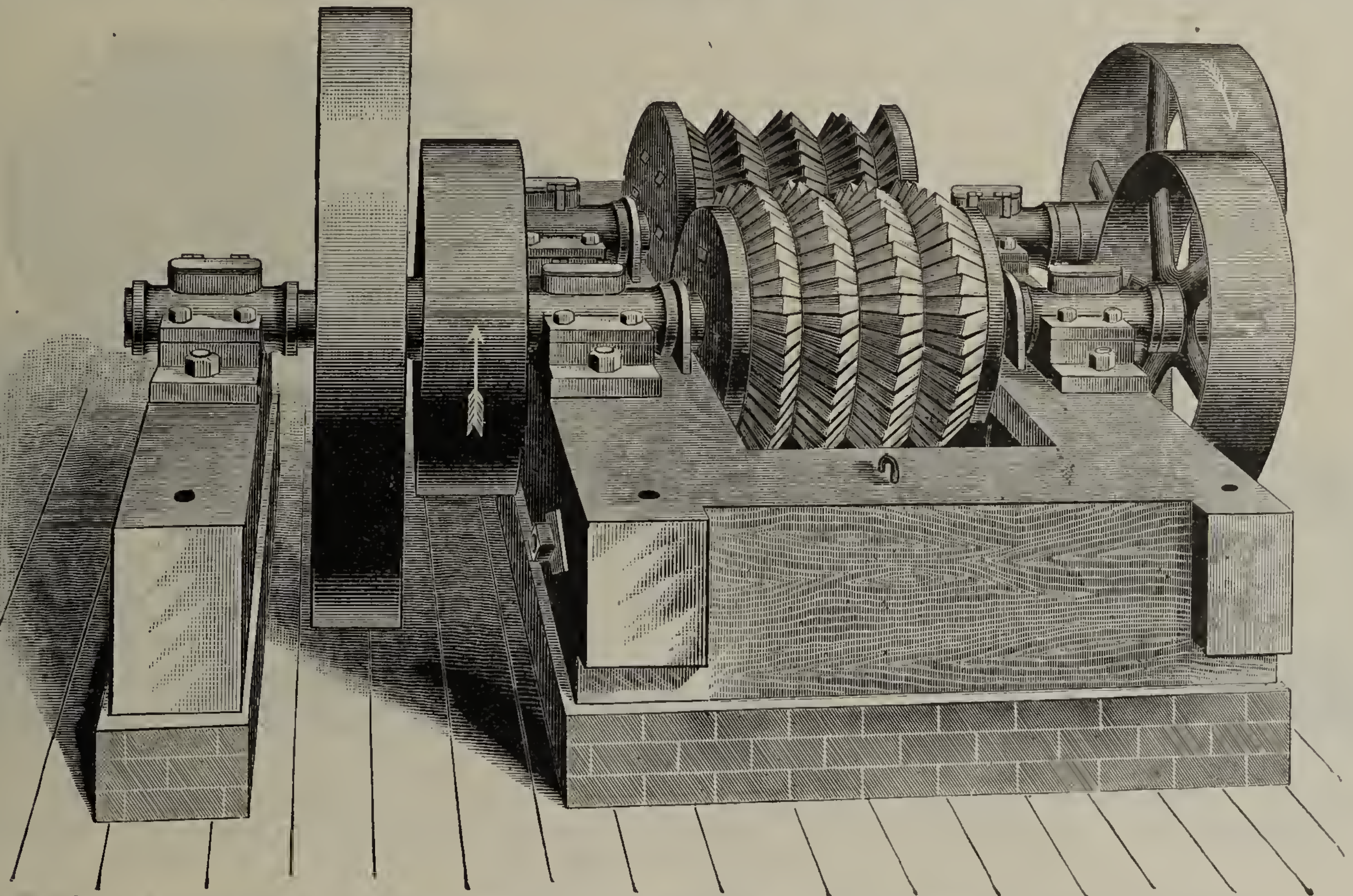
KANSAS CITY, MO., August 21, 1888.

DEAR SIR—In answer to your favor of the 16th will say, that we do not think there is any room for improvement in the Adrian Brick and Tile Machine Co's No. 4 Cut-off Table, as it cuts the brick as near perfect as possible, without tearing the edges; thus leaving the ends of the brick as perfect as the face. We are also using the new dies on both our machines, and are well pleased with them, as they are 100 per cent. better than the old style and turn out a perfect column of clay without warping or twisting. We have two No. 3 McKenzie machines and they are doing excellent work for us and we averaged during July, 26,800 brick, each, per day. In conclusion we will say that both the new tables and the new dies are so incomparably superior to the old ones that it gives us much pleasure to recommend them.

Very truly yours,
SEDDON & EDWARDS BRICK CO.

NEWELL IMPROVED CLAY PULVERIZER

We Guarantee the Material and Workmanship and allow a Trial of our Machine to any Responsible Party.



NEW 19-INCH LETTER C PULVERIZER, WITH HOPPER REMOVED.

Heavy Cold Rolled Shafts running in best Anti-Friction Metal Bearings, protected from dirt.

A FEW OF OUR CUSTOMERS AND REFERENCES:

Henry Maurer & Son, (3 Pulverizers) 420 E. 23rd St., New York City.
Peerless Brick Co., Philadelphia, Penn.
Perth Amboy Terra Cotta Co., (2 Pulverizers) Perth Amboy, N. J.
Syracuse Pressed Brick Co., Syracuse, New York.
Potomac Terra Cotta Co., (2 Pulverizers) Washington, D. C.
Siner & Brother, Frankford, Penn.
W. H. Perot, Baltimore, Md.
The Rathbun Co., Deseronto, Ontario, Canada.
Murrill Dobbins, (3 Pulverizers) Philadelphia, Penn.
American Brick & Tile Company, Phillipsburg, New Jersey.

Send for Illustrated Circular and Price List.

NEWELL UNIVERSAL MILL CO., - 10 Barclay St., NEW YORK.

Of Interest To Every Brickmaker Intending To Purchase Disintegrators.

A WARNING.

Jonathan Creager's Sons, of Cincinnati, Ohio, are now manufacturing a Clay Disintegrator which is an infringement on our Patents. We have brought suit against them in the United States Circuit Court for the Southern District of Ohio.

We presume that this will be accepted as a sufficient answer to their statements in May number of Clay-Worker that our former notice was meant for bluff only.

We intend fully to protect our rights, and only waited until it was apparent that they were being wilfully infringed to bring suit.

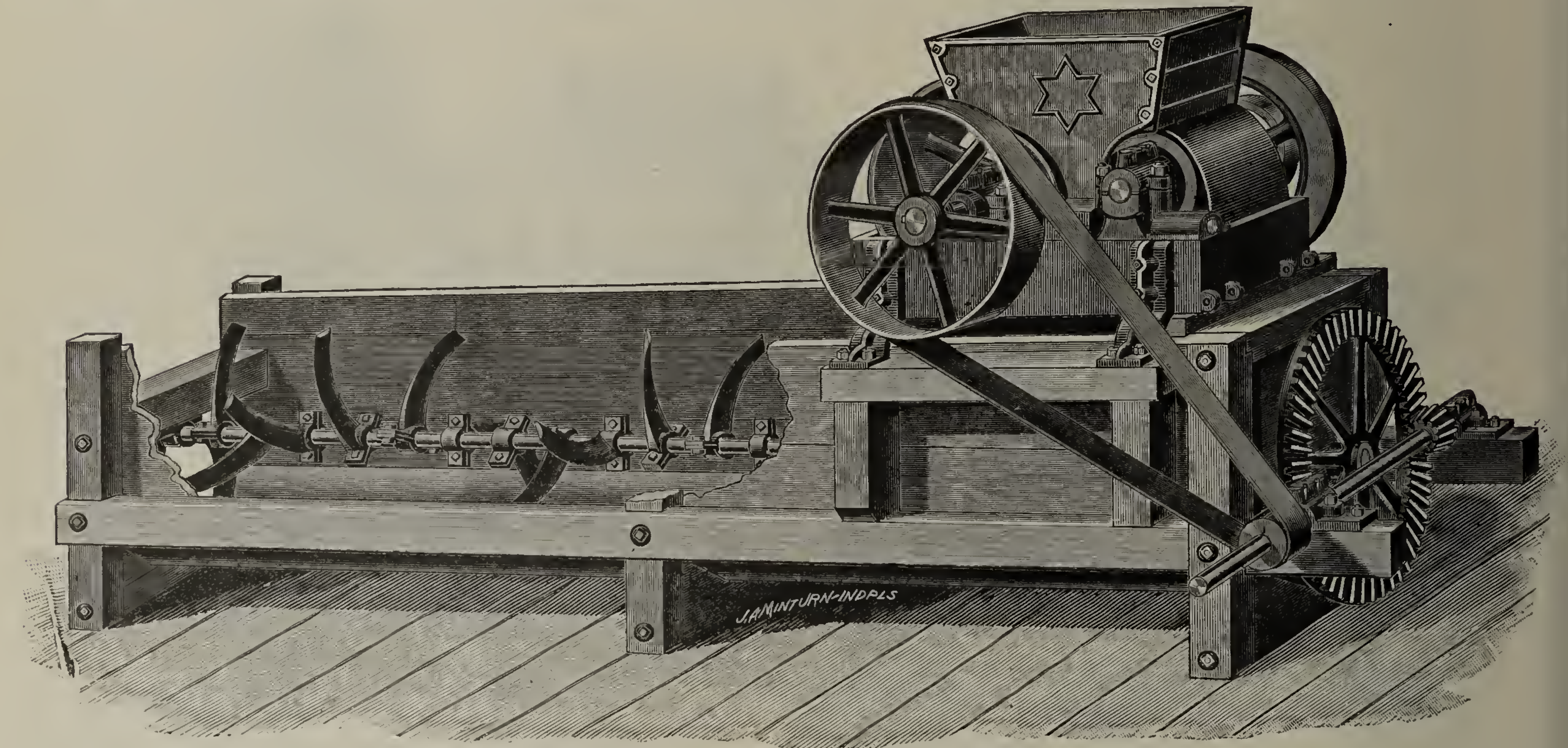
Our Patents are numbers 322,393, *dated July* 14*th*, 1885, 368,898 *dated August* 28*rd*, 1887, *and* 384,278 *dated June* 12*th*, 1888.

Always Buy The Best

AND ONLY

Combined Clay Disintegrator and Pug Mill

The only machine that will work any clay direct from the bank, either wet or dry, thoroughly pulverizing all lumps, clods, and stone. It will not clog or choke It requires no extra man to punch the clods into it. The rolls do not wear or break as roller crushers do, necessitating a new set of rolls every two or three months.



It Will Save Its Cost In A Short Time.

The Pug Mill will thoroughly mix and temper the clay, putting it in better condition for making mud brick than can possibly be done with the soak pit. It will save from three to five dollars per day in labor and make better quality of brick.

C. & A. POTTS & CO.,

INDIANAPOLIS, - - INDIANA.

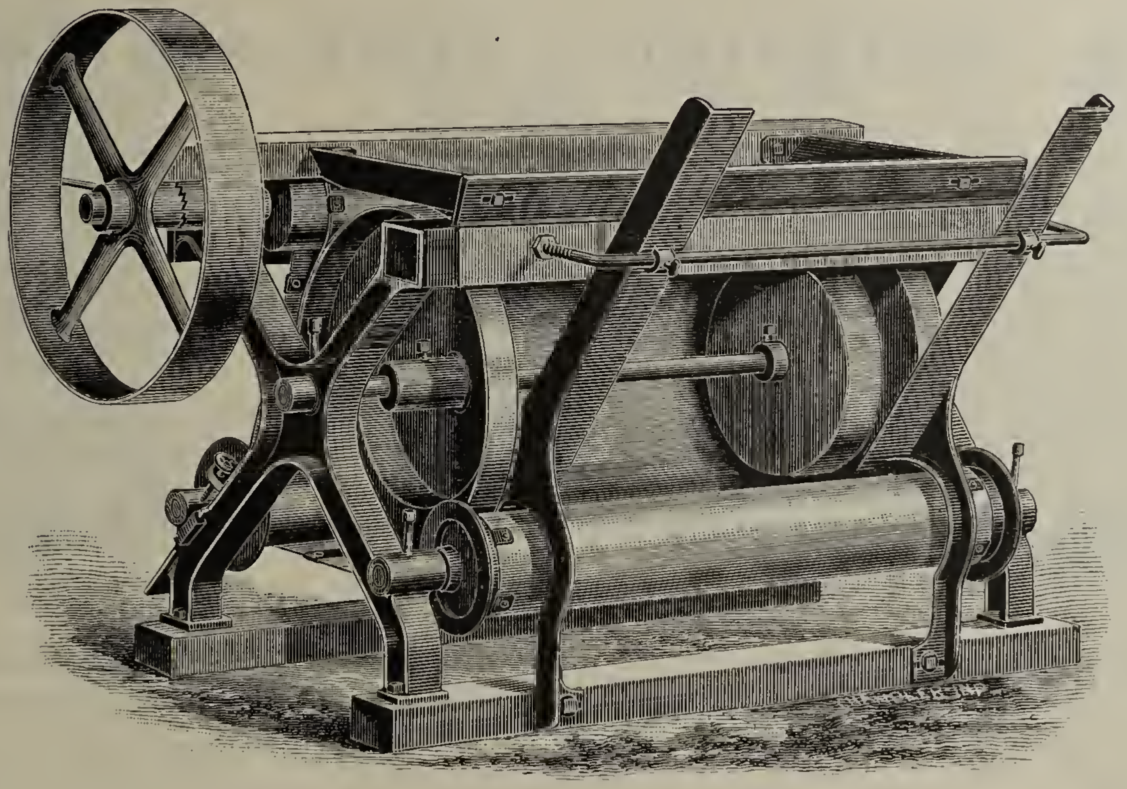
BRICKMAKERS, READ!

What a Few of The Users of Our Sander Say:

C. & A. Potts & Co:

GENTS:—As to your Mould Sander, we can only say that we could not ask for a machine that is nearer perfection both as regards simplicity and efficiency. It does not and cannot leak. The moulds do not and cannot clog or catch, and we are satisfied with it in every way. You are at liberty to use this in any way you may see fit and we shall be pleased to answer any inquiries, or show the machine at any time to any one you may send here. We are yours truly,

BERLIN BRICK CO.



W. H. Cater, Brick Manufacturer.

Appleton, Wis., May 25th, 1889.

C. & A. Potts & Co.:

GENTS:—I have set your Sander and given it a fair trial. It is just what I want and is just what you claim for it, and has given perfect satisfaction. Yours truly,

W. H. CARTER.

No Brickmaker using Brick Machinery can afford to be without this machine. It sands the moulds more perfectly than can be done by hand, every mould being sanded the same. It does not Waste or Spill the sand. The moulds cannot catch and cause delays. It never strikes for more wages, but is always ready for work.

All machines are guaranteed to do all claimed and will be shipped subject to approval.

Prices lower than any. Write for illustrated circular.

We also manufacture a full line of Brick Yard Supplies.

C. & A. POTTS & CO.

☞NOTICE:—A. H. Newton, of Cohoes, N. Y., claim our machine is an infringement on patent owned by them, and that persons using our machine will be prosecuted. As to this we would say that we do not infringe said patents; that we have put our machines on the market only after a careful investigation, to ascertain exactly what our rights are in the premises, and, being fully satisfied of our rights, we are prepared to protect our customers and Patents No. 397,274 of Feb. 5, 1889.

C. & A. POTTS & CO.,

[Mention the Clay-Worker.]

INDIANAPOLIS, INDIANA.

MORRISON'S IMPROVED KILN

FOR -:- BURNING -:- CLAY -:- WARES

Especially adapted to Burning Common, Repressed and Ornamental Brick.

PATENTED IN UNITED STATES AND CANADA.

SUCCESSFUL! DURABLE!

Daily product of our Kilns in the United States, One-Half Million Bricks. Our claims fully substantiated BY OUR PATRONS. We claim ninety to ninety-five per cent. hard brick. Arch bricks all Fronts and Pavers and none damaged—of uniform color. Pressed brick burned without fire-marks—coal screenings preferred for fuel. One fireman for two hundred thousand bricks. The

Only Kiln That Regulates the Temperature of Heat

And directs its course by a system of air drafts, giving complete control of the degree of heat, as well as its manipulation. This system we have covered by letters patent. Any persons using these air drafts are liable to prosecution for infringement.

Read the following testimonial from a recent patron, and another new one from an old patron:

Knoxville, Tenn., October 31st, 1888.

R. B. Morrison, & Co., Rome, Ga.:

GENTLEMEN—I have used your *Improved Kilns* during the past twelve months and cheerfully report the result. We burn our bricks in your Kiln at a cost of sixty-five cents per thousand for fuel and labor; a saving to us, over our old method, of eighty cents per thousand on the two items. My saving in waste brick in the kiln and at the building is fully *ten per cent.*, or sixty cents per thousand in other words. Every time I burn your kiln of 300,000 bricks it is a saving to me of *more than four hundred dollars* over the old process. I find your kiln durable and simple to operate. We use coal screenings for fuel. Have no waste in arches, and burn ninety per cent. hard brick. I have no hesitation in pronouncing your kiln a success in every respect, as you make no claims it does not fulfill. Yours Truly,

REPS. JONES.

Atlanta, Ga., July 20th, 1888.

R. B. Morrison & Co., Rome, Ga.:

GENTLEMEN—We have used your Improved Kilns for three years and during that time have burned upward of a hundred millions in them and wish to emphasize our former statement in regard to your kilns. They are reliable, durable, and the best kilns for our purpose, we have been able to find after investigating many of the various kilns in use, and say to our friends of the trade: If you want kilns that will burn your brick nearly all hard. and do it every time, burn them economically and without loss, and with little cost for repairs, secure the Morrison Kiln. CHATTAHOOCHEE BRICK CO., per GEO. W. PARROT, Vice-Pres.

—WE SELL OUR KILN STRICTLY ON MERIT—

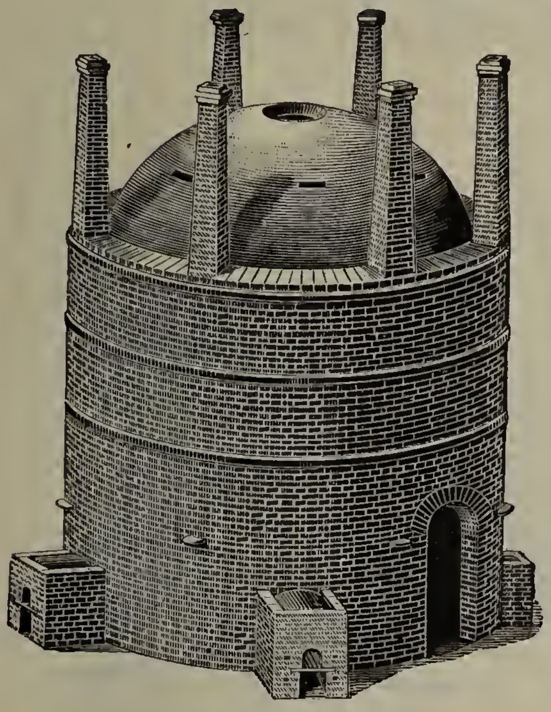
☞For descriptive circulars, additional testimonials, and all information desired, address

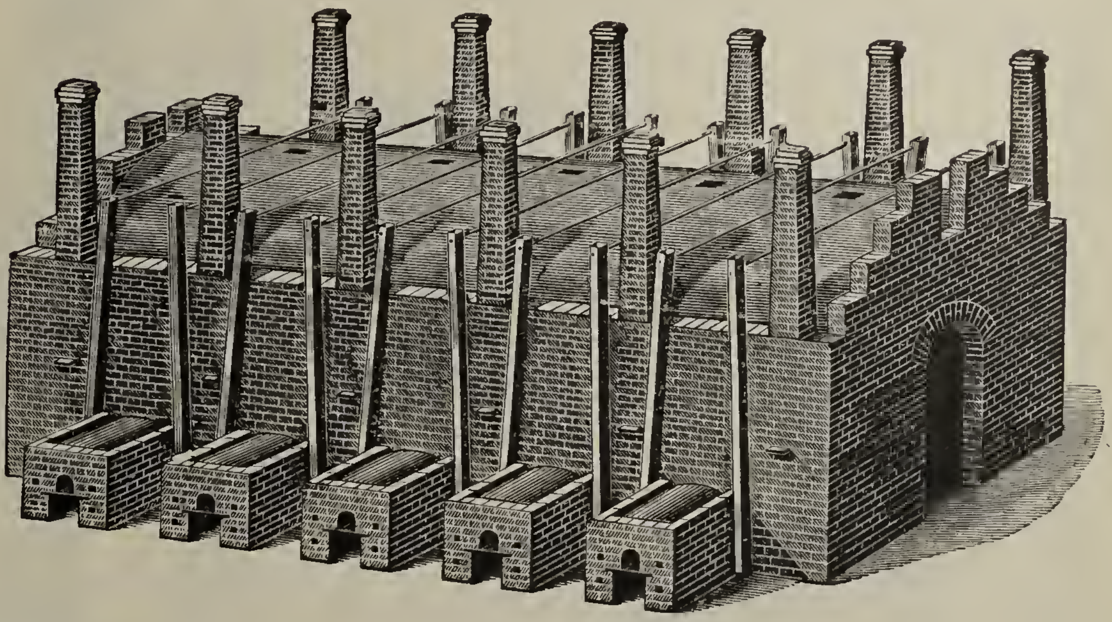
R. B. MORRISON & CO.,

Box 335, - - - - ROME, GEORGIA.

THE EUDALY KILN.

BURNS ANY KIND OF CLAY OR WARE.





THE DOWN-DRAFT KILN.

UNIFORMITY IN BURNING is without a doubt the most essential feature to clay workers. Especially is this the case with fine clays where it is desired to have the wares of uniform color, size and hardness.

In the construction of these kilns particular attention has been paid to this point, by having first carefully examined the subject of drafts and the strength and nature of the different kinds of fuel. The size of the kiln, the size and number of furnaces, flues and chimneys must always sustain the proper relation to each other for a perfect draft. Too much draft is as dangerous as too little. One of the greatest mistakes of kiln inventors and builders is that they utterly disregard the important subject of drafts.

ABILITY TO DIRECT THE HEAT TO ANY PART OF THE KILN is equally as important as a proper draft. Unless the burner has control of the heat in the kiln he has no assurance of a uniform burn. In these kilns if the burner finds the wares too hot in any portion of the kiln he can in a moment shift the heat to any other part where it is not so hot, or what is better, if he has two or more kinds of wares in the kiln, one of which requires more burning than another, he can easily give that portion of the kiln an extra amount of heat. We claim that this is the only kiln in which these results can be attained successfully.

For this reason wares can be burned by this system **more uniformly** than by any other.

Practically there is no difference from top to bottom, yet this is purely a *down draft* kiln. There are no inside dampers or cut-offs. **Everything about the kiln is permanently built.**

ECONOMY OF FUEL AND LABOR is perhaps the second most important feature of any kiln. We hear a great deal said about "economy in fuel and labor," but to understand what is necessary to a fuel and labor saving kiln one should be thoroughly acquainted with all kinds of fuel and the conditions necessary to get the greatest number of heat units out of it, and at the same time **distribute the heat to the burning wares in the most effective manner.**

We claim that our latest improved furnace is the most **complete economizer** of fuel that has ever been invented.

The construction is purely scientific, and is made by first obtaining the chemical requisites necessary to insure perfect combustion and then building a furnace to bring about these results. Different kinds of fuel require a different size and construction of furnace. We use any kind of fuel, soft coal, screenings, oil, gas or wood.

COST OF CONSTRUCTION.—These kilns require no large stack, which ordinarily costs as much as the kiln proper. Many persons think they must have a large, tall stack in order to have sufficient draft to get the bottom of the kiln burned.

This is certainly a mistaken notion.

The things that are required, however, are a correct location and size of furnaces, flues and chimneys with reference to each other and the kiln. When these are properly attained the burner need have no fear about draft.

In these kilns great care has been taken to adjust these relations in such a way that the expensive stack is not at all required, and a much better draft obtained.

DURABILITY.—Each part of these kilns is built with special reference to strength and durability.

The furnaces, which are perhaps the most perishable parts of any kiln, are in these kilns made very strong and durable.

Those parts most liable to burn out can be easily removed and replaced without damage to the other parts of the furnace.

Rules are given by which a builder of these kilns can get the strongest crown and best supports to the kiln.

SIZES.—These kilns can be built either **round** or **square**, and of **any** desired **size**. A number of these kilns are now in use that burn from **150** to **250** thousand bricks at a time. The walls are built **twenty-four inches thick**. They should be lined throughout with fire-brick where the clay is very hard to burn. Good kilns can be made, however, without using fire-brick for any part except the **furnaces** and **bags**. In asking for cost of construction **state size of kiln in feet wanted**, whether the kiln walls, crown or bottom are any or all to be lined with fire-brick.

DRAWINGS and specifications for building kilns will be furnished any who purchase *kiln or yard rights*. We usually can urnish a man to superintend the building if desired.

For further information address

W. A. EUDALY,

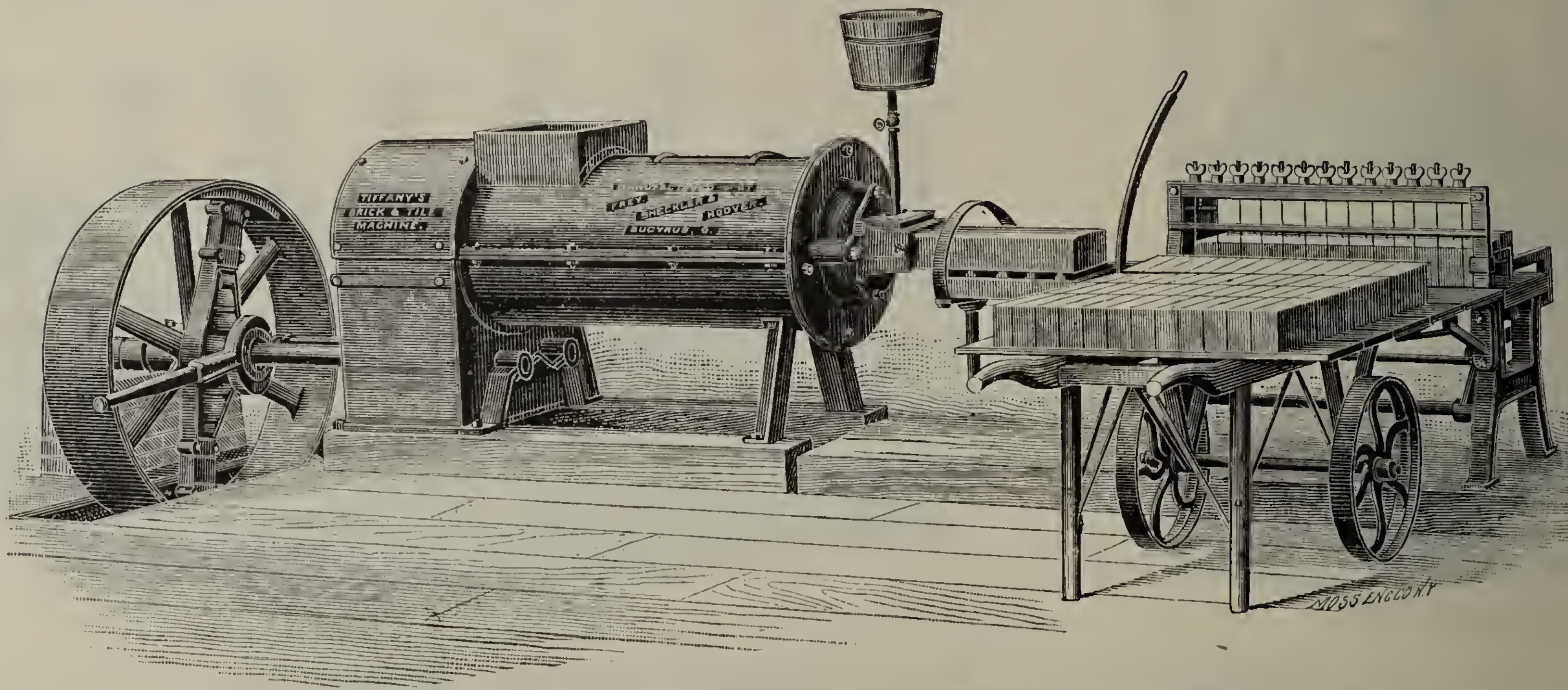
64 Johnston's Building, - - - - CINCINNATI, OHIO.

THE FREY, SHECKLER CO.

BUCYRUS, OHIO

With increased facilities threefold.

Seven different brick machines. Four different tile machines. Will make any quantity of brick or tile as desired.

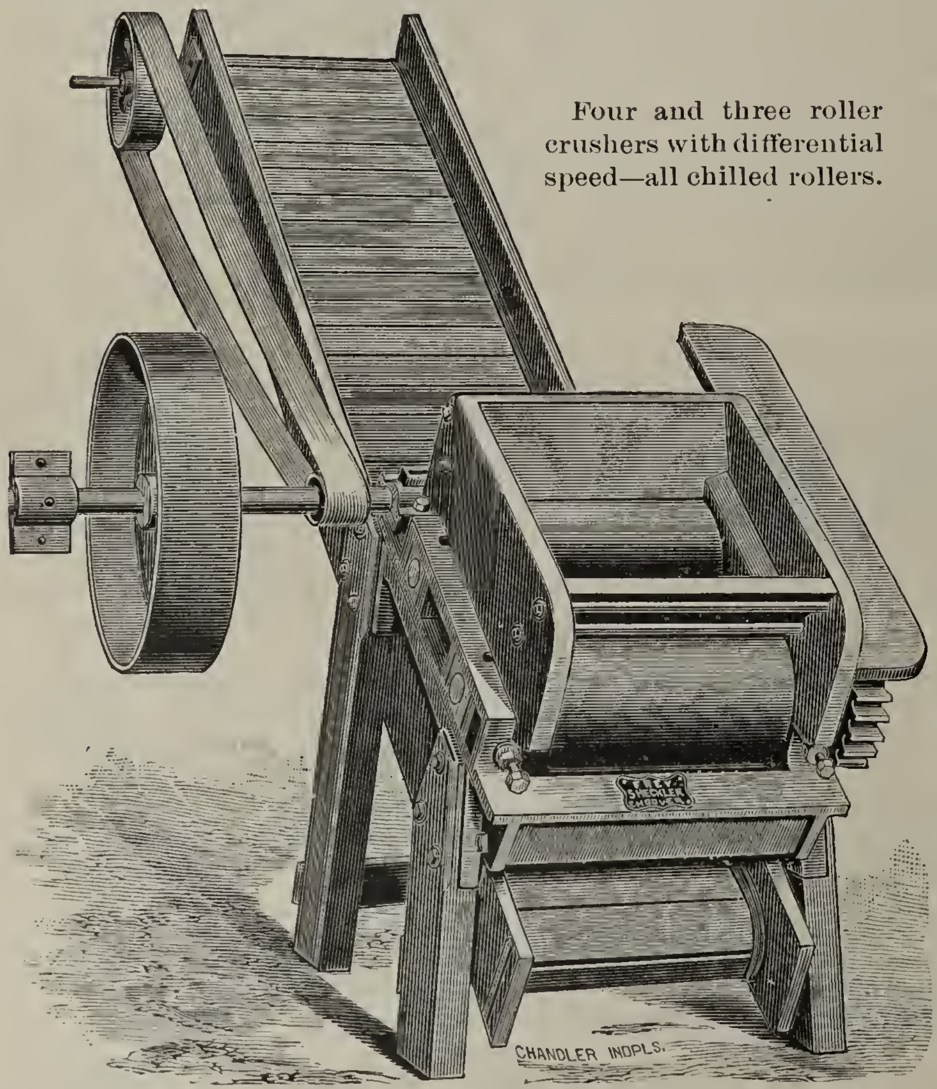

TIFFANY'S BRICK & TILE MACHINE.
FREY, SHECKLER & HOOVER BUCYRUS, O.
MOSS ENG CO NY

The Mascot for light power and low in price.

CUT OF CENTENNIAL WITH SELF-LOADING ATTACHMENT ON CUTTING TABLE.

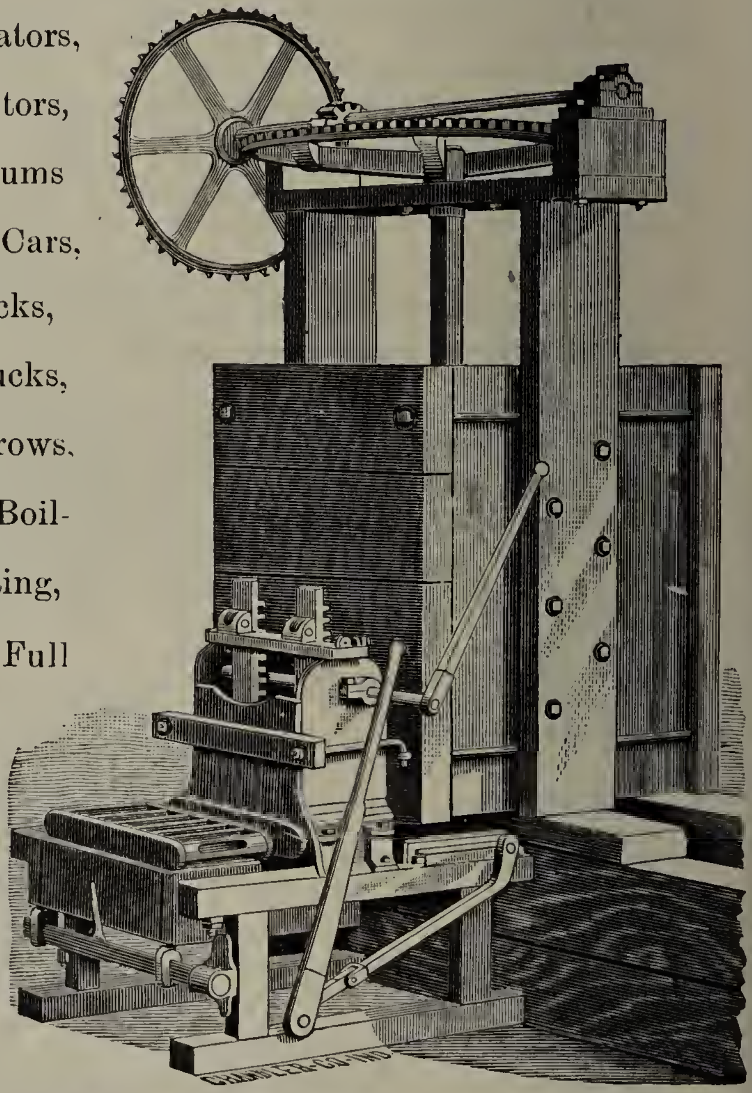
The above cut shows the Board Delivery Cutting Table which loads the brick automatically on special trucks in connection with the Centennial Tiffany Machine and Patent Lubricating Brick Die. Acme Special Brick Machine, largest capacity. The Duplex, 80,000 brick per day.

Four and three roller crushers with differential speed—all chilled rollers.


CHANDLER INDPLS.

We make thirteen different patterns of Roller Clay Crushers. All rollers best chilled iron.

Clay Elevators, Tile Elevators, Steam Drums and Dump Cars, Tile Trucks, Brick Trucks, Wheelbarrows, Engines, Boilers, Shafting, Pulleys. Full outfits for Brick and Tile Factories and Fire Clay Works.



The Eagle Brick Machine.

Cheapest and Simplest for Horse and Steam power.
(16,000 brick per day.)

PLANS FOR KILNS FURNISHED CUSTOMERS.

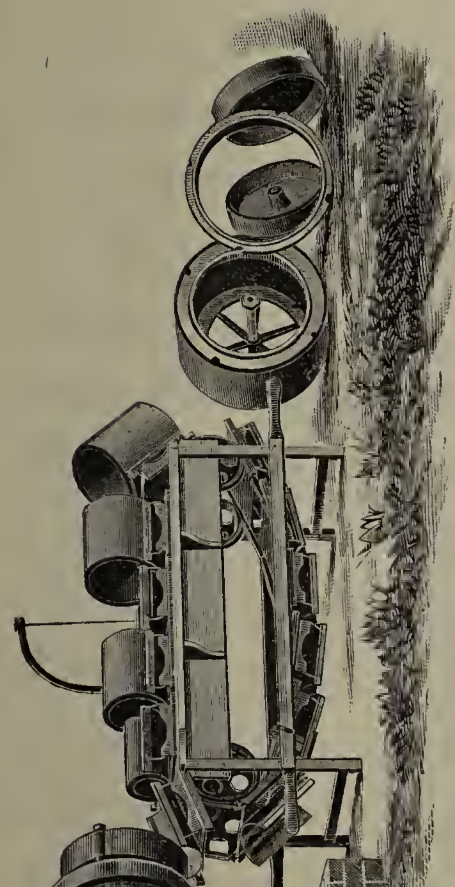
Send for illustrated circulars to

The FREY, SHECKLER CO., Bucyrus, Ohio.

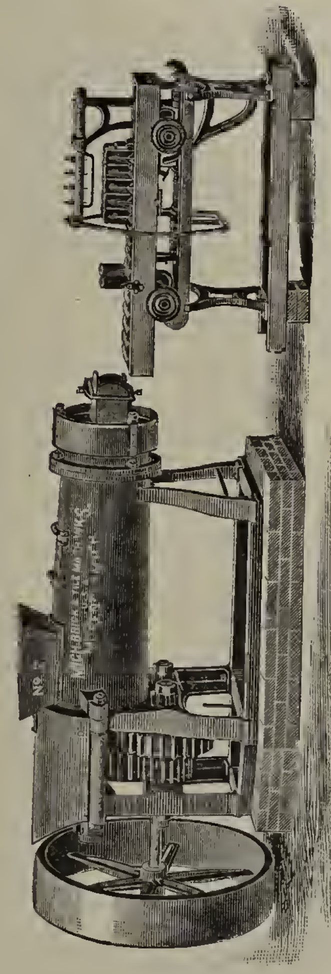
MICHIGAN BRICK AND TILE MACHINE WORKS,

—MANUFACTURERS OF—

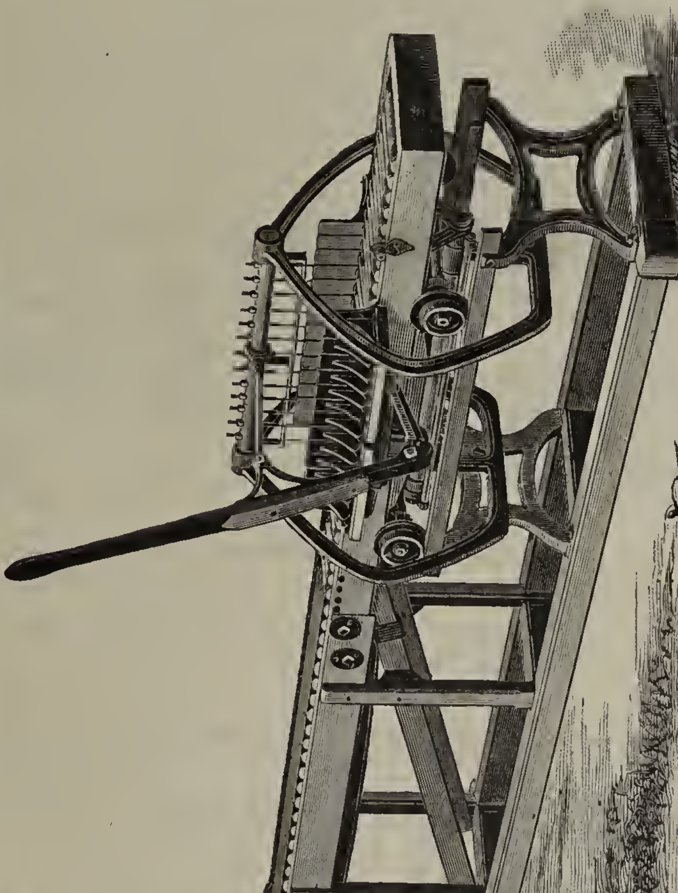
Brick and Tile Machinery.



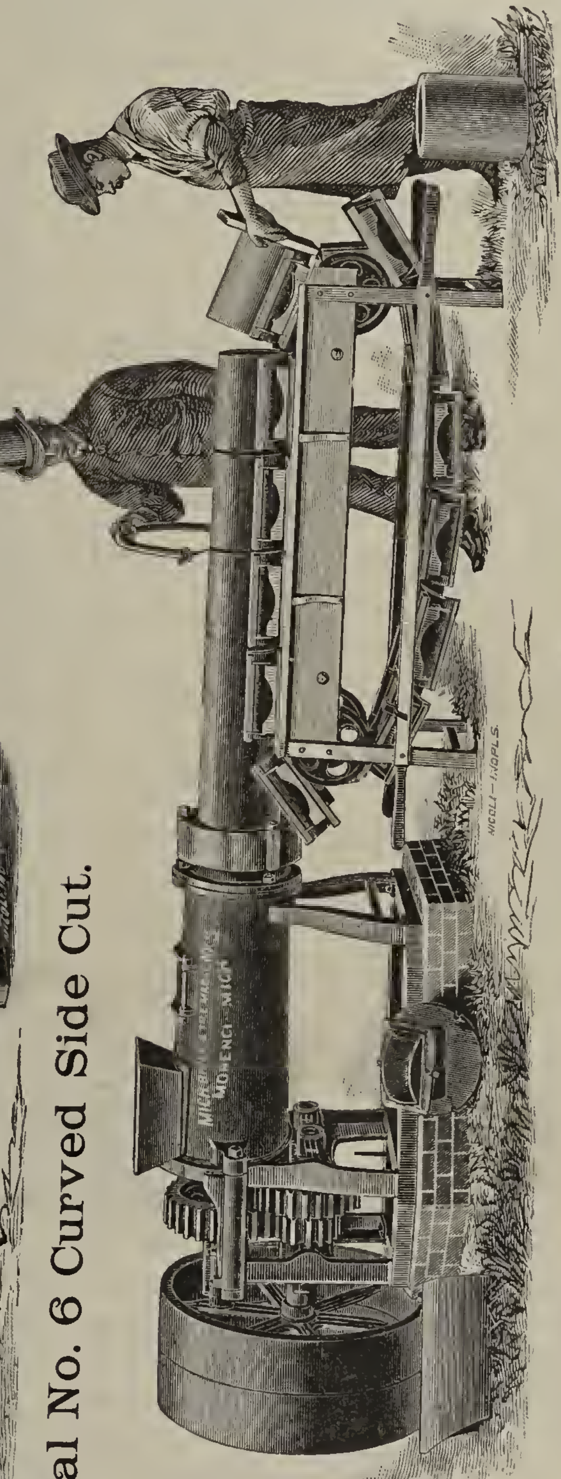
No. 6 Special Brick and Tile Machine.



No. 2 Brick and Tile Machine.



Special No. 6 Curved Side Cut.



No. 1 Brick and Tile Machine.

☛Send for Descriptive Circular.

MICHIGAN BRICK AND TILE MACHINE WORKS,

Lenawee County, [Mention the Clay-Worker]. MORENCI, MICH., U. S. A.

PROGRESS

A practical experience of nine years entirely devoted to the building of brick machinery and the operation of the same in different localities of the United States and Canada, with close observation to all the requirements necessary to successful and profitable production, we confidently offer our services with a complete line of machinery—that embodies recent and practical improvements. We will offer our Grand Automatic Brick Machines (steam power) constructed entirely of Iron and Steel, at once powerful and compact, being equipped with our Safety Pitman, which is set to withstand the amount of pressure required to perfectly fill the moulds with stiff mud and should any obstacle get under the Plunger, the Safety Pitman lets go and the Press Crank becomes an Idler until the obstruction is removed and the Pitman reset, which is done in 30 seconds or one-half of one minute. This Pitman is adjustable to any degree of resistance, is adapted to both our Wood Frame and All Iron Machine, can be quickly placed on any of our machines now out, and is the most practical device of its kind ever invented. We construct All Iron Pug Mills for attaching to brick machine or for any purpose. We challenge the market generally and earnestly court the investigation of all in need of reliable machinery, that To-day ranks FIRST, where quality of the output combined with cost of production are any consideration.

As regards our Disintegrator, we know we have a good thing, (if we had not Potts would not trouble us) and we publicly acknowledge the fact that the Messrs. Potts have instituted suit against us for infringement of their patents. We have only to say that we shall defend the suit, believing as before stated, that we are not infringing what belongs to them. We are confident of our success in the matter, and as the case is now in the hands of the Court, we abide the Court's decision, which must necessarily govern both the Messrs. Potts and ourselves.

Our catalogue and full information, prices and discounts, will be promptly mailed on application by addressing the manufacturers,

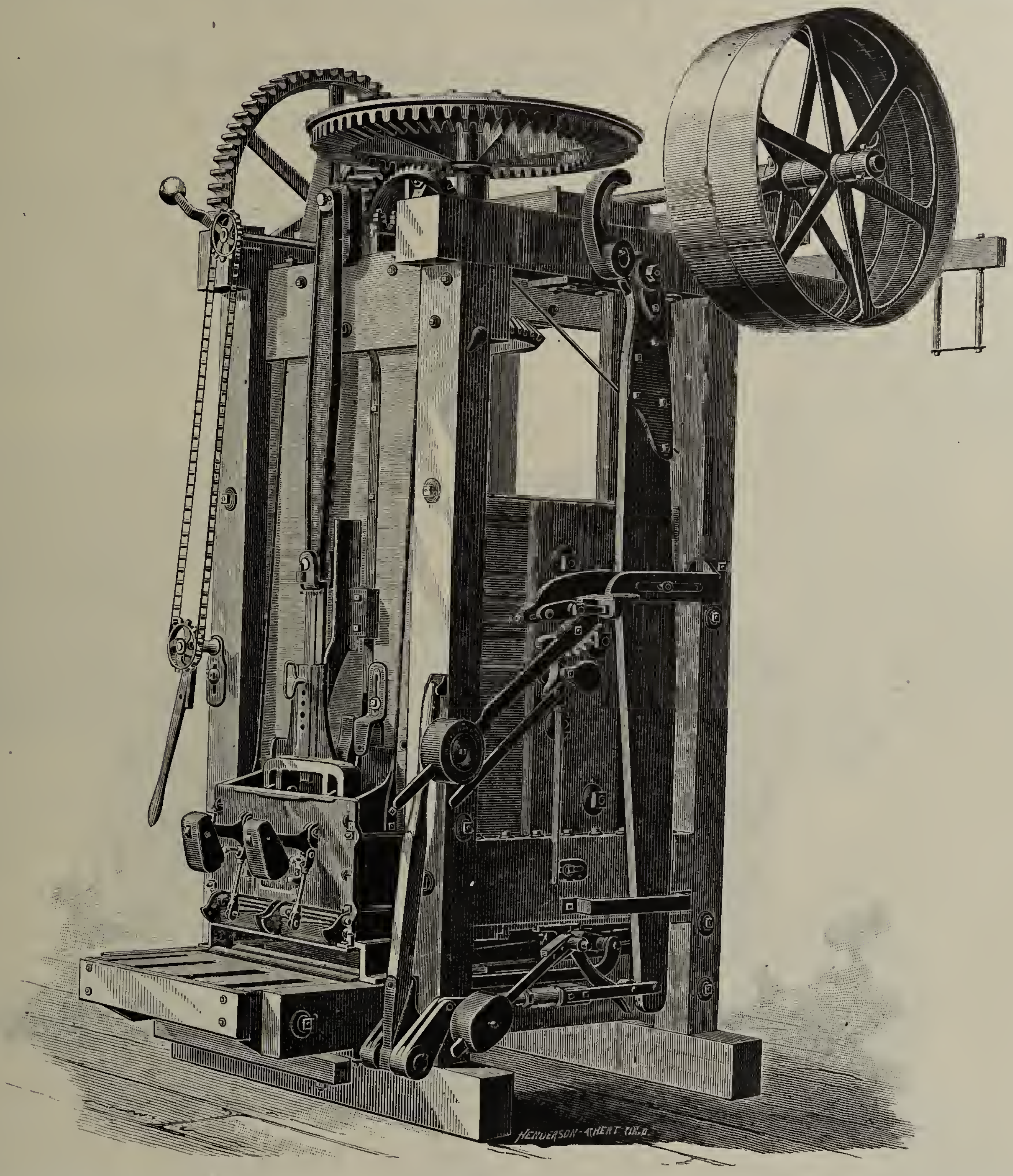
JONATHAN CREAGER'S SONS,

Office, 127 W. Second Street,

CINCINNATI, OHIO.

[Mention the Clay-Worker].

The "Tiffin" AUTOMATIC Brick Machine


HENDERSON-ACHERT LITH. CO.

The "Tiffin" **Automatic** Brick Machine is, **beyond question**, the best machine of its class in the market. It is **Heavy, Strong and Durable. IT IS GUARANTEED TO DO GOOD WORK.**

The **"TIFFIN"** is made for use by **Steam**, or **Horse** power. The capacity of the **Horse Power Machine** is 18,000 to 20,000 per day, and of the **Steam Power** 25,000 to 40,000 per day, according to the speed at which they are operated.

Both styles are equipped with our **Automatic "Stone Doors,"** which permits a stone, or any other hard substance, that may have passed in with the clay, to pass out **without breakage to the Machine.**

PRICES:		
	Steam Power Machine - -	$350.00
	Horse Power Machine -	$250.00

The principal shafts are of Steel, and all other material used, is **First Class. Competent Workmen Only Employed** in their construction. These machines have been **Thoroughly Tested** in the hands of **Experienced Brickmakers** during the past season, and with the most **Satisfactory** results to them. Parties who may be **Interested Enough** to wish to make inquiry, will be given the names and address of the parties who have had them in use.

We are the makers of the **CELEBRATED "OLD RELIABLE"** Brick Machine, for use by hand power, which is so well and favorably known to the Brickmakers of the entire country. We are also manufacturers of Turn Tables, Trucks, Wheel Barrows, Molds, Kiln Doors, Etc., Etc. Correspondence solicited.

TIFFIN AGRICULTURAL WORKS,

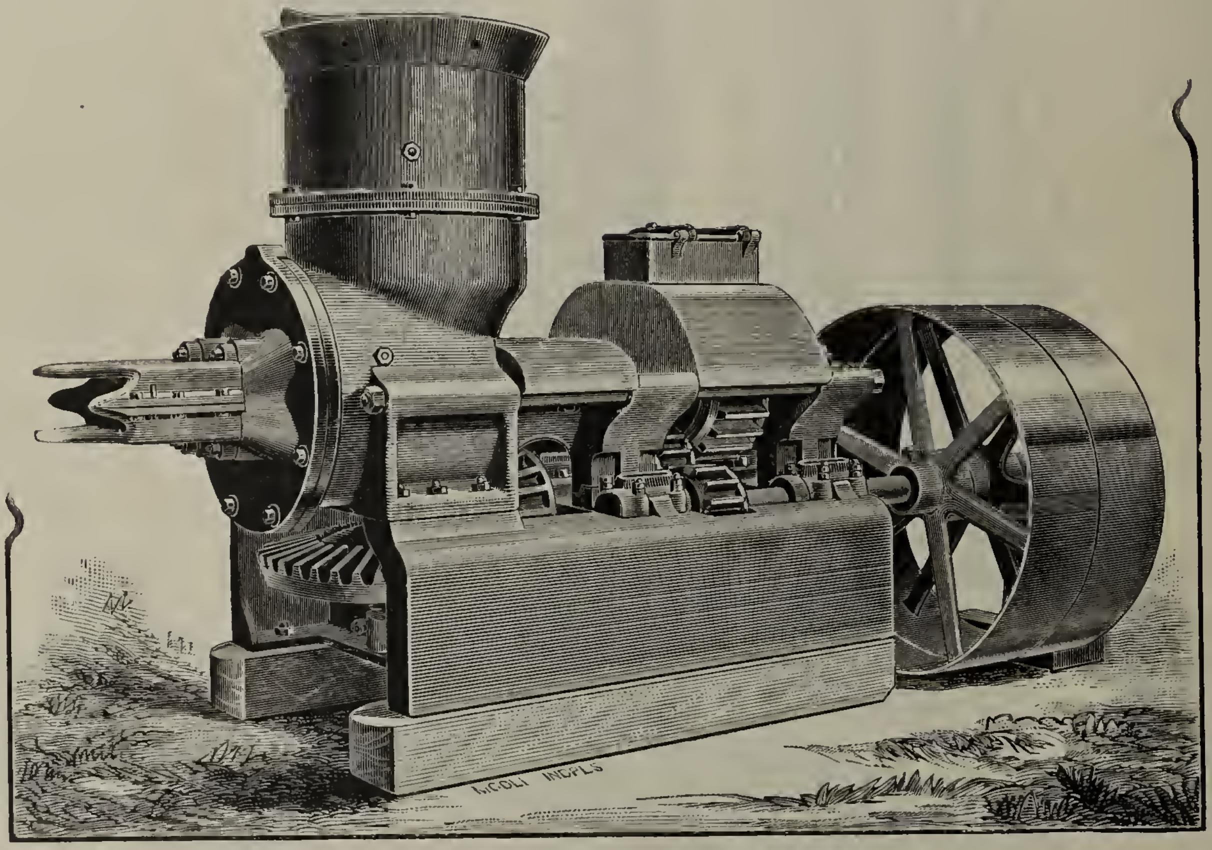
[Mention the Clay-Worker.]

TIFFIN, OHIO.

The Wallace Manufacturing Company,

FRANKFORT, INDIANA.

In the antique races we may have been beaten but Ben Hur is now holding the reins on a new team—the Little and Big Wonder which we are confident will roll up a good bank account for any one who will invest their money in them.



The above cut represents the Little Wonder in its new dress.

The Big Wonder with Automatic Table will appear in the near future.

For full particulars of the Big and Little Wonder, Automatic Table, Clay Crushers and Stone Separators, Pug Mills, Trucks, Iron Cars and other Clay Working Supplies, write to

THE WALLACE MFG. CO.,

FRANKFORT, IND., U. S. A.

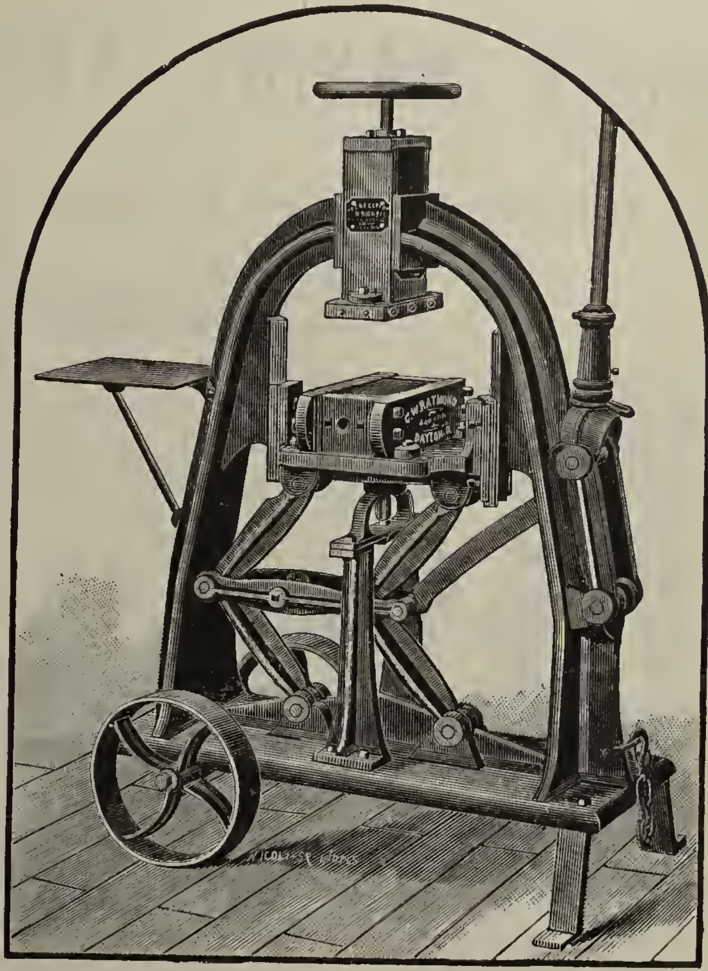
Mention the Clay-Worker.]

RAYMOND'S
PERFECTION BRICK PRESS.

(NO. 1 FOR RED BRICK. NO. 2 FOR FIRE BRICK.)

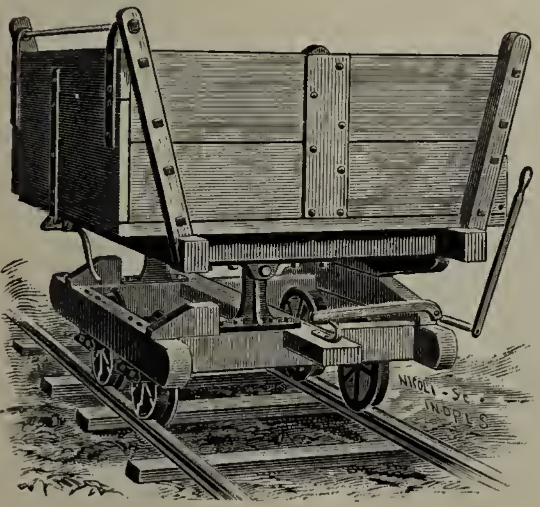
SIMPLE, POWERFUL.

Its whole action is derived from a short, easy, but powerful movement of one lever. A Perfect press which turns out perfect work.



——MANUFACTURERS OF——

AUTOMATIC DUMPING CARS,



For Brick Yards, Gravel Pits, Plantations, Mines, Etc.

SAVES TIME.

SAVES LABOR,

SAVES MONEY.

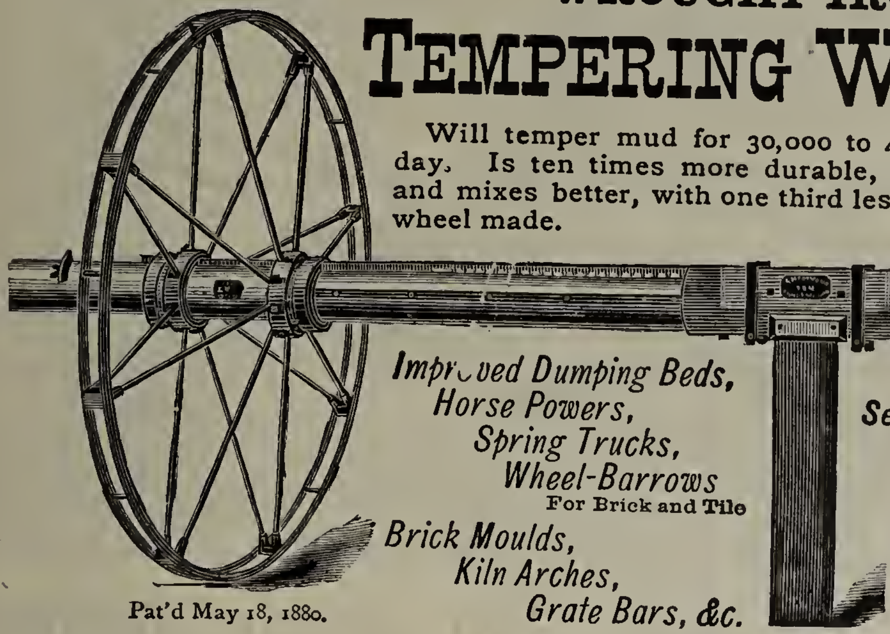
Write for Illustrated Catalogue giving full description.

RAYMOND'S

WROUGHT IRON

TEMPERING WHEEL

Will temper mud for 30,000 to 40,000 bricks per day. Is ten times more durable, Tempers faster, and mixes better, with one third less draft than any wheel made.


RAYMOND'S SELF REVERSING WROUGHT IRON TEMPERING WHEEL.

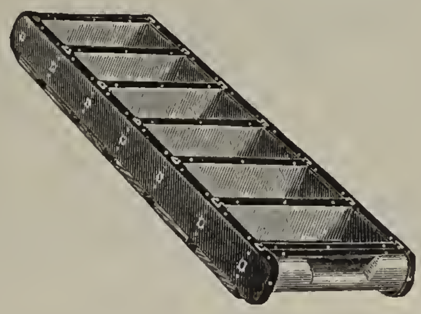
Pat'd May 18, 1880.

Improved Dumping Beds,
Horse Powers,
Spring Trucks,
Wheel-Barrows
For Brick and Tile
Brick Moulds,
Kiln Arches,
Grate Bars, &c.

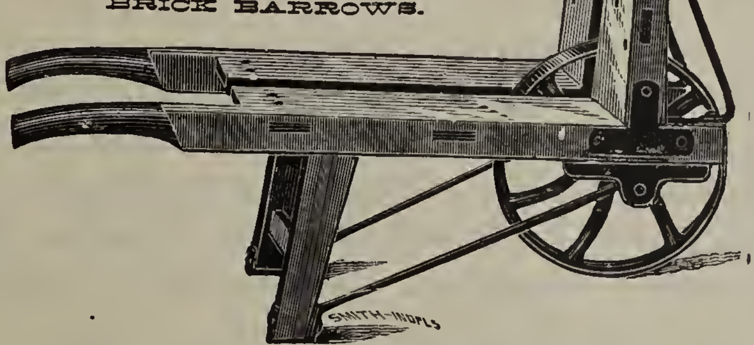
Send for
CIRCULAR.

BRICK MACHINE MOLDS.

We manufacture a great number and variety of molds and with improved machinery, we are able to fill orders with dispatch. Our molds are made of the best of cherry wood with side pieces gained for partitions and each partition is in turn dove-tailed into the sides. **They are thoroughly iron bound.** The cross-irons being dove-tailed. Without doubt, the most substantial mold made.



BRICK BARROWS.



Our Barrows are made from the best of seasoned white-oak, braced in front and cross braces underneath; iron wheel and axle and three coats of paint; the frame is morticed throughout. They will stand the rough usage of the brick yard. For strength and durability they have no equal.

C. W. RAYMOND & CO.,

7 & 11 WAYNE STREET, **(Mention Clay-Worker.)** DAYTON, OHIO.

A. POTTS & CO.,

INDIANAPOLIS, INDIANA.

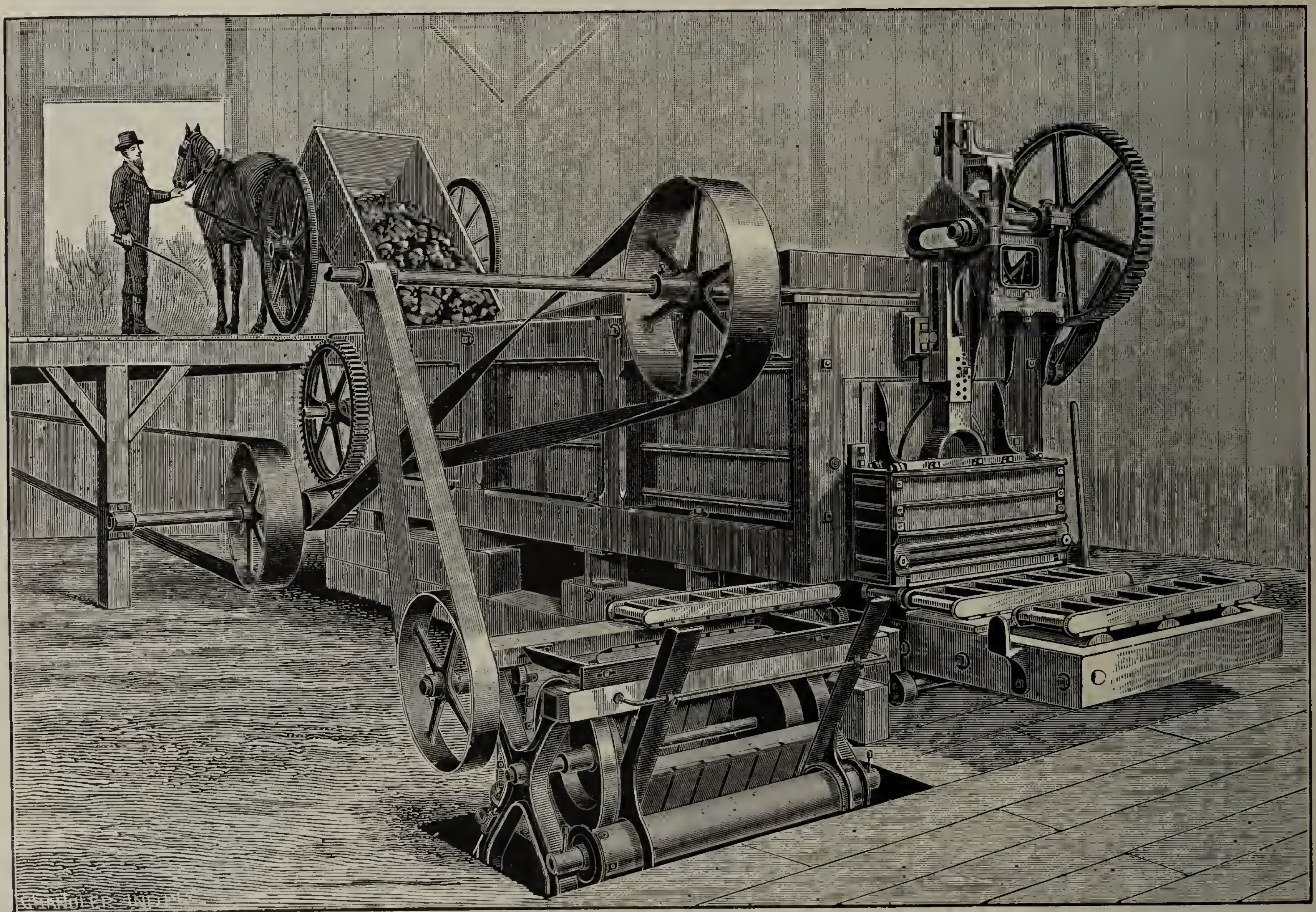
—MANUFACTURERS OF—

BRICK MAKING AND CLAY WORKING MACHINERY,

Including

Sand Mould Brick Machines, Pug Mills for Soft and Stiff Clay,
Mould Sanders, Disintegrators, Elevators, Kiln Castings and Yard Supplies

We are prepared to erect complete plants of any desired capacity.



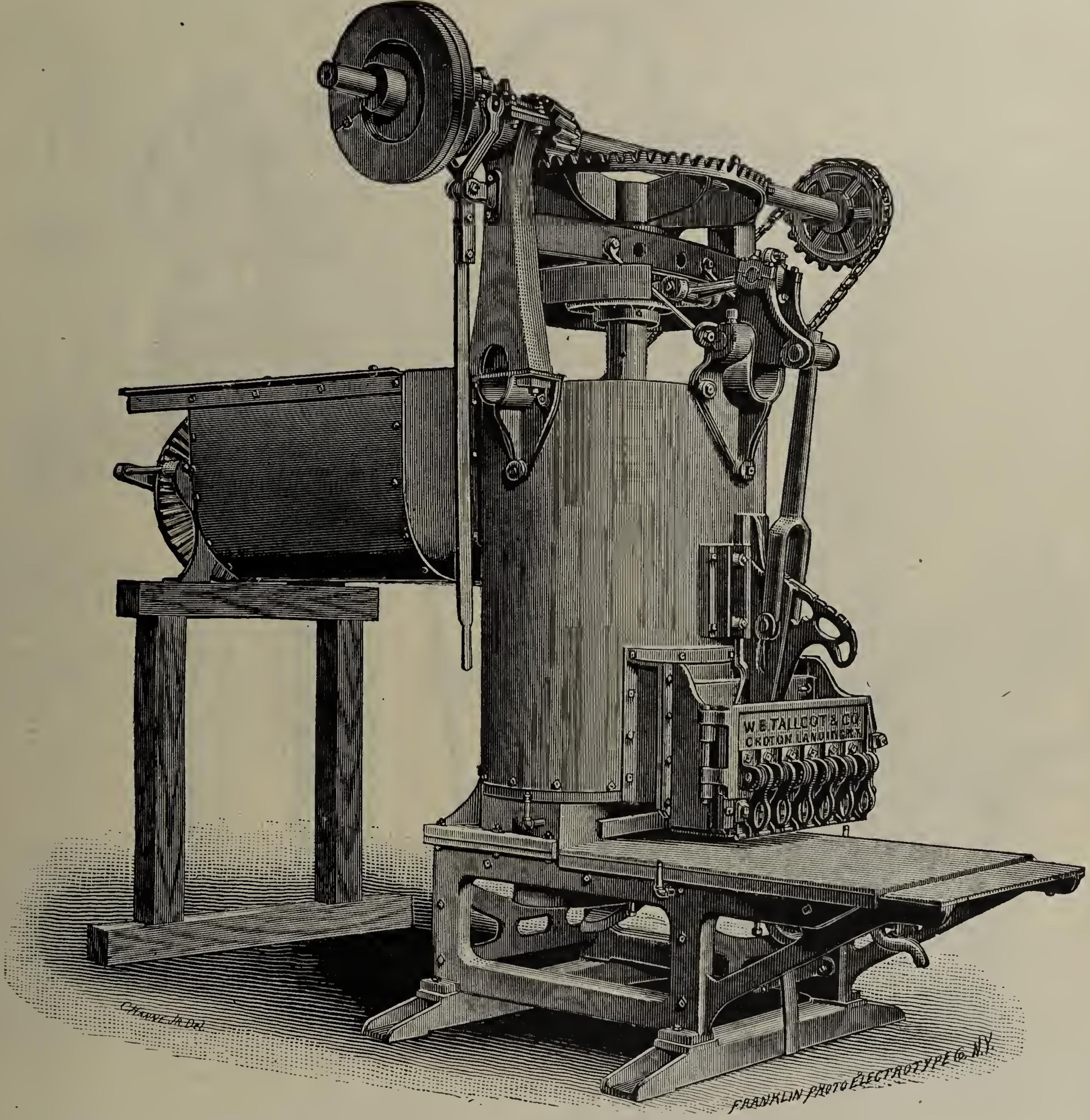
OUR HORIZONTAL STOCK BRICK MACHINE AND MOULD SANDER

Is the best machine on the market for making sand moulded brick.
It is strong and powerful and will work the clay stiff enough to make the finest stock brick.
It works the clay direct from the bank not requiring extra Pug Mills as all vertical machines do.
It has no equal for Strength, Durability, Quantity and Quality of brick made.
It has no light complicated parts underneath machine, all parts being out where they can be kept clean.
Don't fail to write if in need of machinery in our line. Our prices are the lowest.
We shall be pleased to mail our complete descriptive circular.

ADDRESS

A. POTTS & CO., - - Indianapolis, Indiana.

W. E. TALLCOT & CO'S.
I. X. L. Brick Machine and Improved Pug Mill.


W. E. TALLCOT & CO.
CROTON LANDING N.Y.
C. HANE JR. DEL.
FRANKLIN PHOTO ELECTROTYPE Co. N.Y.

This is a simple and powerful machine, making a superior brick and possessing advantages over all others. It is the result of years of experience in using and manufacturing brick machines. Among its advantages are *Great Strength, Simplicity and Durability* few parts, well protected from sand, yet easy of access for adjustment, renewal and repair. No wood is used in its construction; it is made all of iron and steel. Perfect automatic action to prevent breakage by stones or other obstructions. Great tempering capacity and ability to mould very stiff clay. It is easily understood, easily operated, easily kept in order. Quality of brick made, unsurpassed

The I. X. L. is eipecially designed and built for heavy work. Weight of Machine and Pug Mill 10,000 pounds. Weight of Machine without Pug Mill, 7500 pounds. Send for circular and prices.

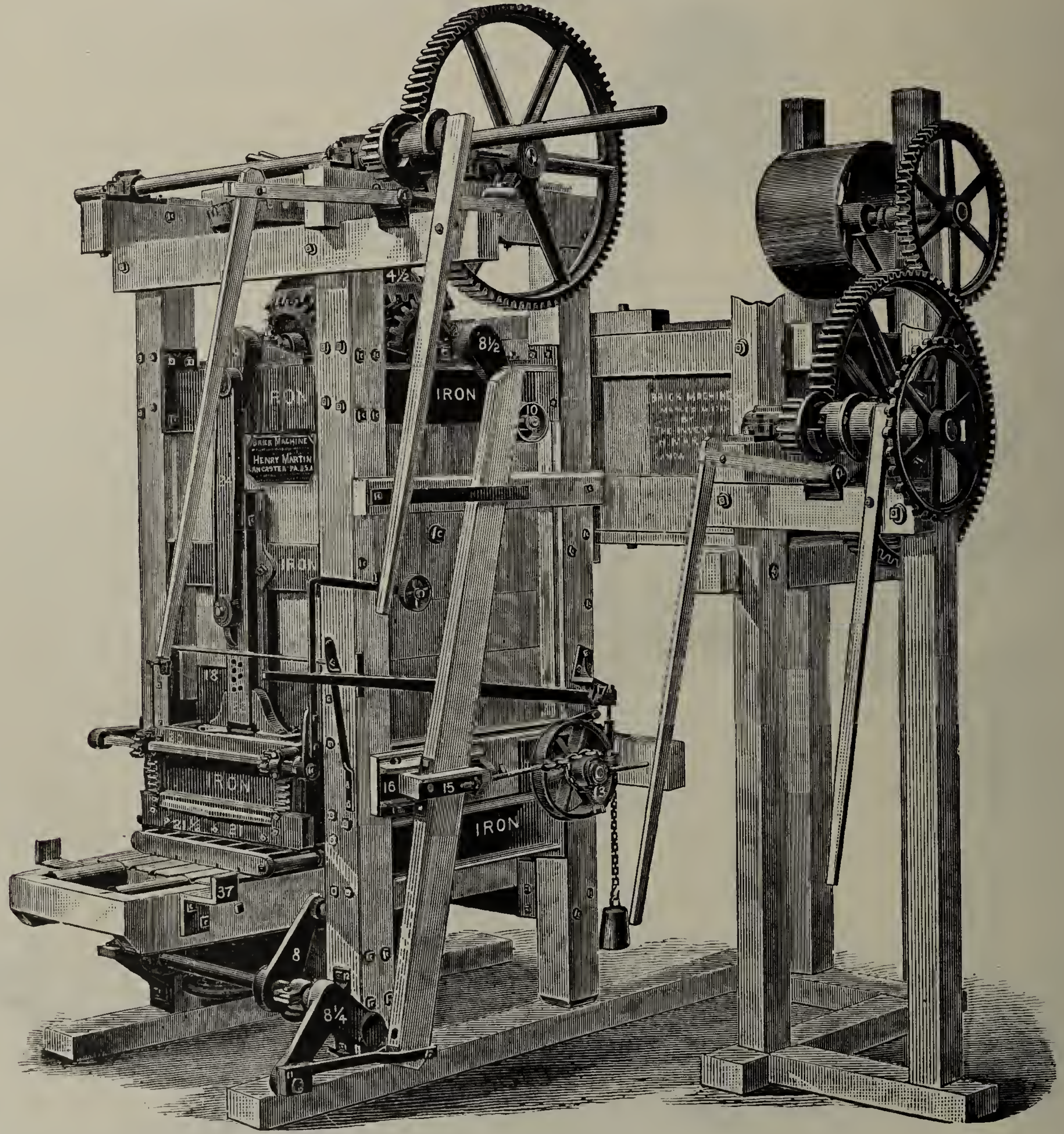
It will pay you to use the I. X. L.

W. E. TALLCOT & CO.,
Croton Landing. New York

The Henry Martin Brick Machine.

For Steam or Horse-Power.

WITH OR WITHOUT PUG MILL



WITH OR WITHOUT PUG MILL.

This cut represents our Steam-Power Machine and Pug Mill combined. It is the strongest. It is the best. It is the most simple. It is the most perfect. It does the best work. It works any clay. It does not get out of order. It is not liable to break down. It stands hard usage.

BETTER THAN EVER.

Our machines are this season the Best ever built by our Mr. Henry Martin, whose thirty years' experience has rendered him familiar with the wants of the Trade.

For Strength, Durability, Qantity of Output and Quality of Work, they have no equal.

Brickmakers make no mistake when they buy the Henry Martin Machine.

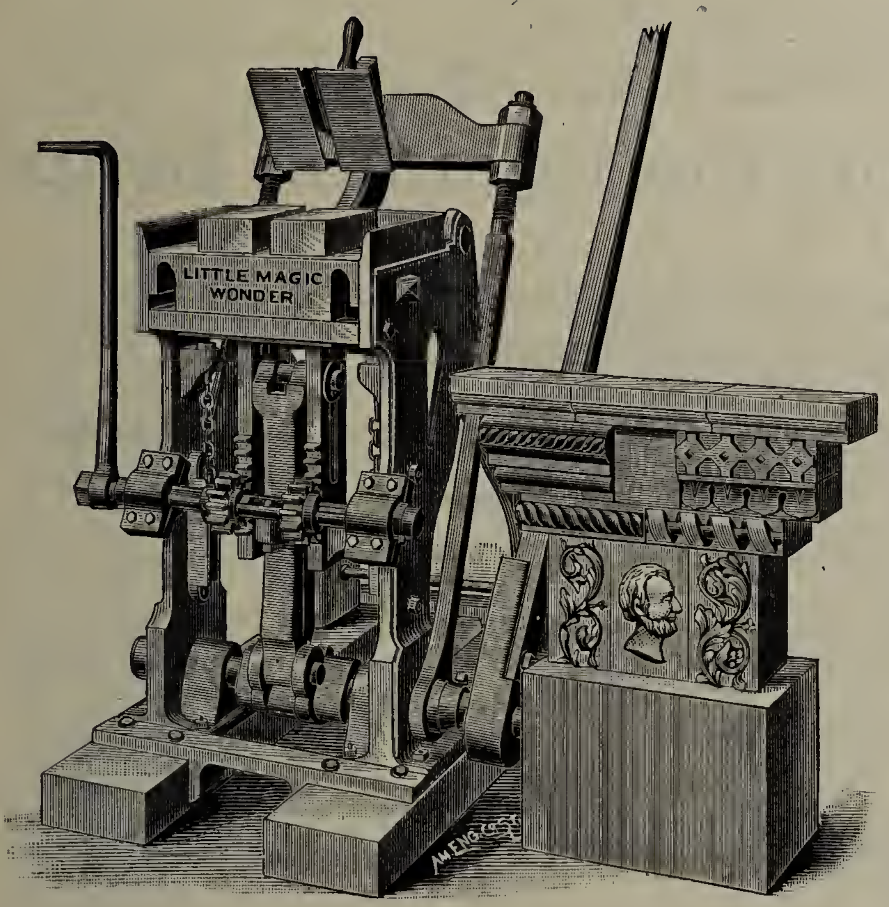
—MANUFACTURED BY—

The Henry Martin Brick Machine Mfg. Co.,

Send for a Catalogue.

LANCASTER, PA., U. S. A.

The LITTLE MAGIC WONDER



It Will Do It!

Over 1,000 Different Patterns of Ornamental Bricks Can Be Made on this Wonderful Press.

Hear What a Prominent Brickmaker Says:

St. Louis, Feb. 3d, 1889.

Mr. Wm. Thaison, Austin, Texas:

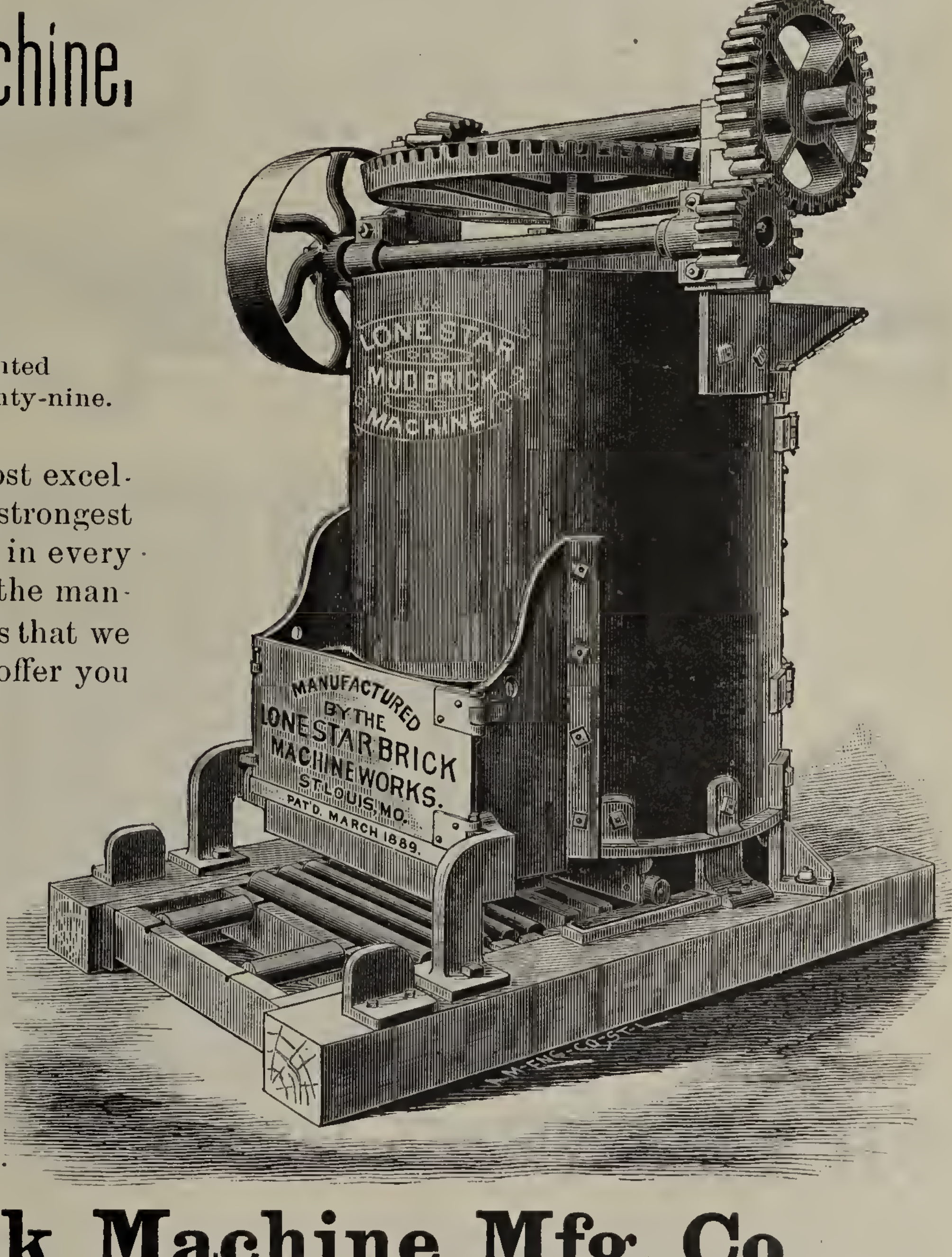
Dear Sir—At the end of a fair and satisfactory trial of your Little Magic Wonder Dry Clay Hand Brick Press, it affords me great pleasure to testify to its efficiency for the purpose intended. I had long been looking for just such a Press, whereon at short notice and at very slight expense we could, within a few hours' time get out small orders for ornamental bricks of special designs and patterns without interfering with the operation and working of our regular machines. The great value of your Hand Press to me, lies in the fact that we can make bricks upon it by pressure on edge as well as flat wise, thus enabling one to make almost any conceivable design of fancy moulded ornamental bricks. As you let your machines go out on trial there can come no loss to parties intending to purchase.

Very Respectfully, Anthony Ittner.

Mr. Ittner runs two of these machines. His reputation as a gentleman and an expert brickmaker is so well and favorably known to the readers of the Clay-Worker that further comment is unnecessary.

The Lone Star Soft Mud Machine.

Here is something new,
That's intended for you,
It's rather a trick,
For the making of brick,
Both handsome and fine
The best of its kind
Has just been invented
In March eighty-nine.


LONE STAR MUD BRICK MACHINE
MANUFACTURED BY THE LONE STAR BRICK MACHINE WORKS. ST. LOUIS MO. PAT'D. MARCH 1889.

We call your undivided attention to this most excellent Soft Mud Brick Machine. It is of the strongest character and superior to the best in the market in every particular. As we have made arrangements for the manufacturing and putting up of 100 of these machines that we expect to sell this season, we are in position to offer you the most liberal bargains. *Send your order at once and don't delay.*

Capacity:

Steam Power Machine,	30-40,000,	Price $350.00
Horse-Power "	15-20,000,	" 250.00

Our Terms:

One-third cash must in all cases accompany the order to receive recognition or prompt attention.

☛For further particulars and circulars address

Lone Star Brick Machine Mfg. Co.,

AUSTIN, TEXAS.

Mention the Clay-Worker.]

CHAMBERS BROTHERS CO.,

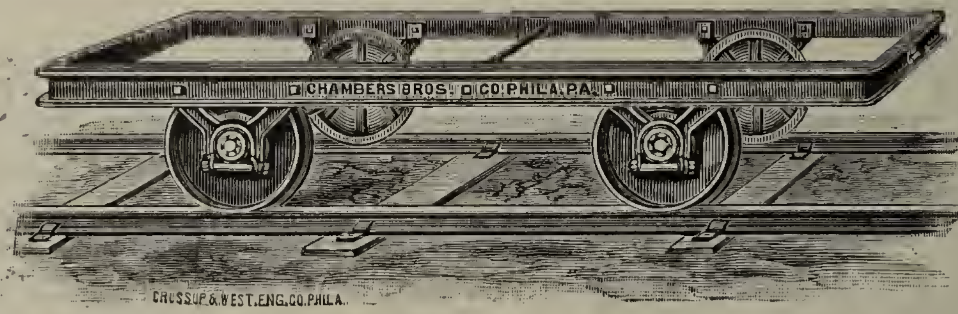
FIFTY-SECOND ST., BELOW LANCASTER AVE,

PHILADELPHIA, PA

Improved Tunnel Dryers For Common Brick

And the Most Durable and Complete System for Transporting Green Brick.

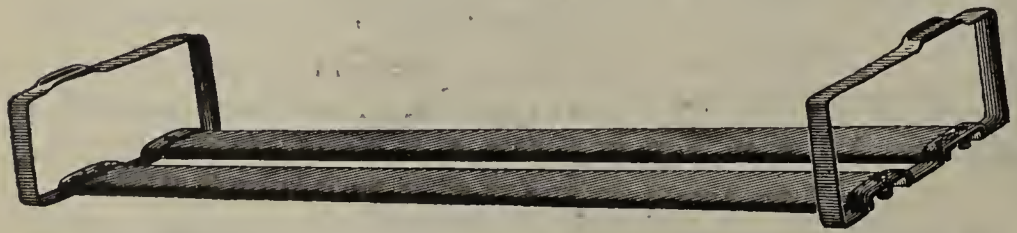
The Strongest Car Made.


CHAMBERS BROS. & CO. PHILA. PA.
CHESSUP & WEST. ENG. CO. PHILA.

The Strongest Car Made.

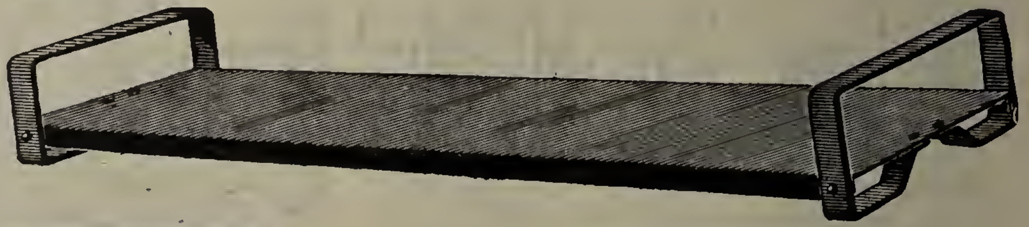
CHAMBERS' WROUGHT-BODY DRYER CAR.

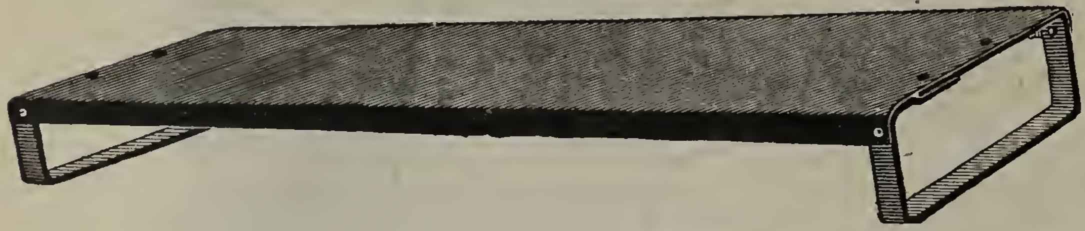
A lower priced Car with cast iron bodies made to order.



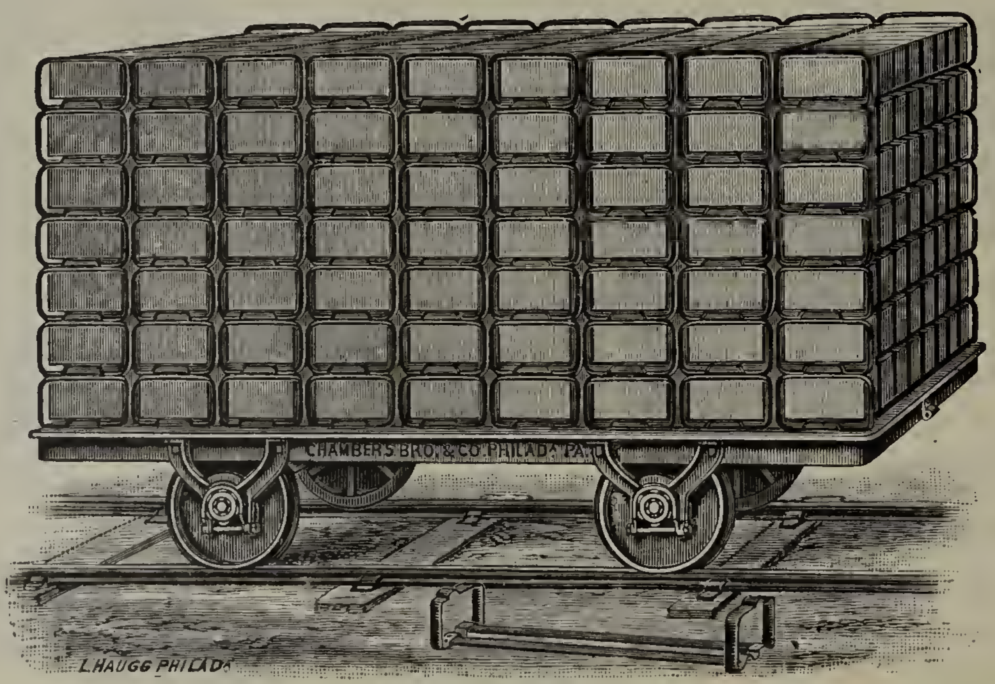
Wrought Iron Interlocking Pallet for Stiff Tempered Brick only.

Steel Pallet for brick placed on flat side or on edge.





Steel Pallet for soft moulded brick, or those placed on flat side only.


CHAMBERS BRO. & CO. PHILAD^A PA.
L. HAUGG PHILAD^A

CHAMBERS BROTHERS COMPANY,

PHILADELPHIA, - - PA.

☞See ad. on front cover page.

[Mention the Clay-Worker.]

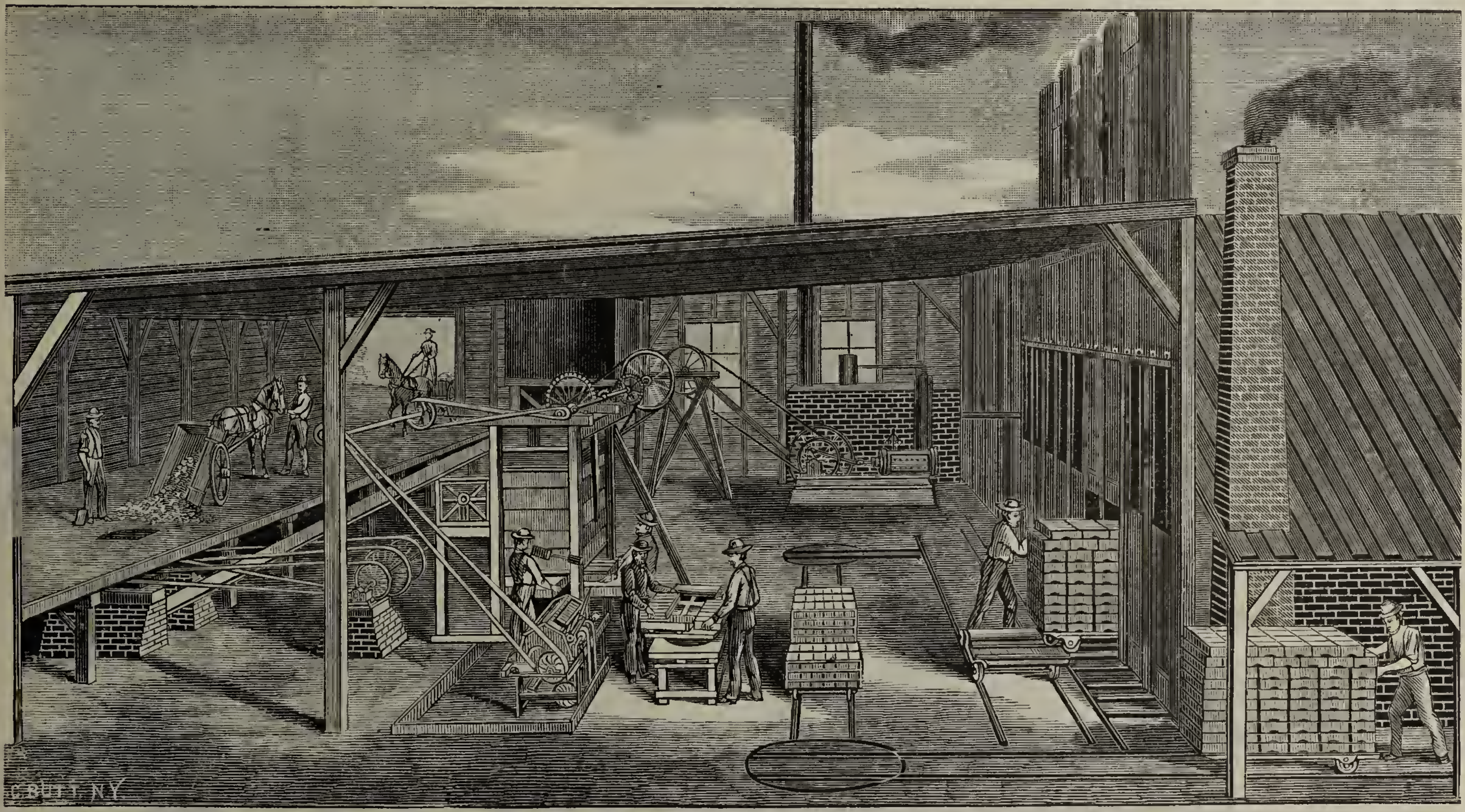
SHARER'S IMPROVED DRYER

* * *

☞ More than one hundred now in use **DRYING SUCCESSFULLY** Soft Mud Brick, Stiff Mud Brick, Pressed Brick, Fire Brick, Hollow Brick, Tile, Plaster, Architectural Terra Cotta, Terra Cotta Lumber, Peat and Lumber. ☜

* * *

No other Dryer in existence can successfully dry such a variety of Materials.



23 are now in process of Construction and under contract to be built this Spring.

The Only Successful Soft Mud Brick Dryer in Existence.

Will also dry Stiff Mud, Semi Dry and Pressed Bricks at 50 per cent. less cost than any Steam Drier.

No other Dryer will Guarantee to dry Soft Mud Brick. I Guarantee to dry any kind of Bricks.

It is not a Direct Heat Dryer, nor a Steam Heat Dryer. It is a Radiated Heat Dryer. The heat being produced from Coal, Wood, Coke, Oil, Gas or any kind of Fuel, and Radiated through Brick or Metal floor. The heat can be so graduated as to successfully dry the most Tender or Refractory Clays without damage. While in a Direct Heat Drier the product of combustion coming directly in contact with the material to be dried will warp, check and crack in most cases. In a Steam Drier the heat cannot be graduated. Neither can heat be produced from Steam near as cheaply as from the Fuel Direct. With a Steam Dryer it is necessary to run one or more Boilers and Exhaust Fans day and night. There is No Machinery whatever necessary to operate my Dryer. Hence the wear and tear and expense of operating is reduced to the minimum.

References and all information given by letter or otherwise. Address,

GEORGE W. SHARER, Proprietor,

134 South Ninth Street,

PHILADELPHIA, PA.

ED. H. CALLAWAY, Gen'l Agt., 72 Reade St., New York.
E. A. KING, Special Agt. New England States, 48 Congress St., Boston, Mass.
HUGH CAMERON, Toronto, Ont., Special Agt. Dominion of Canada.

Improved Eureka Dry Press Brick Machine.

WEIGHT SEVENTEEN TONS.

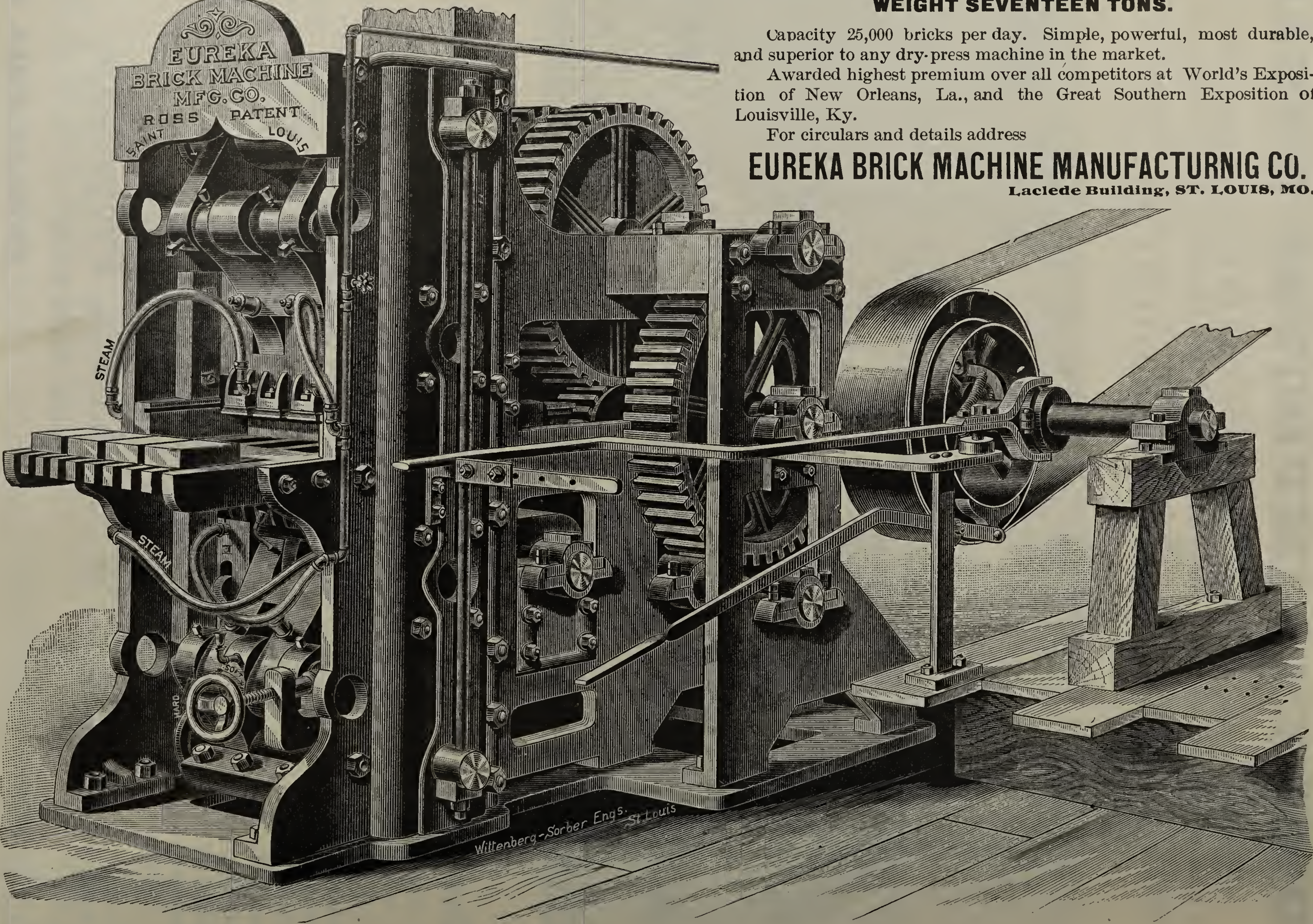
Capacity 25,000 bricks per day. Simple, powerful, most durable, and superior to any dry-press machine in the market.

Awarded highest premium over all competitors at World's Exposition of New Orleans, La., and the Great Southern Exposition of Louisville, Ky.

For circulars and details address

EUREKA BRICK MACHINE MANUFACTURNIG CO.

Laclede Building, ST. LOUIS, MO.

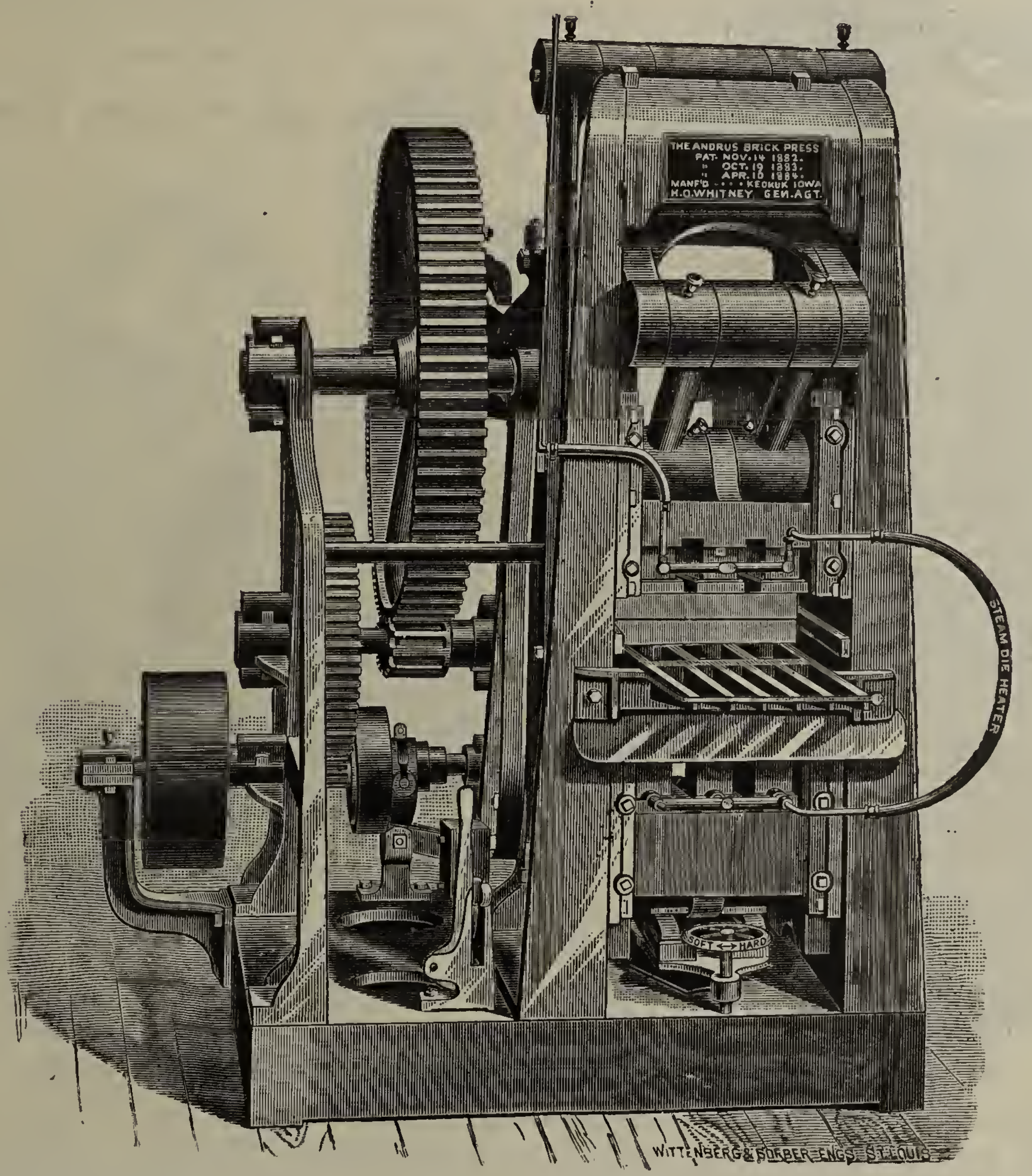


EASTERN AGENCY, 1321 F STREET, N. W., WASHINGTON, D. C. FRANK P STONE, AGENT.

THE

Improved Andrus Double Pressure Brick Press.

UNRIVALLED FOR SIMPLICITY, POWER AND DURABILITY.



The Pressed Brick made on the Andrus Machine have been tested by the U. S. Government and adopted for fronts in Government Buildings.

Built at our OWN FACTORY with heavy forged STEEL pressure arms and fully guaranteed against breakage. Not an experiment but a TRIED and PROVEN success.

60 machines in successful operation the past season. Examine it before purchasing.

Ittner Bros., St Louis, Mo., using the Andrus Presses produced 36 large kilns of brick of unsurpassed quality the past summer.

Samuel J. Rose & Son, Chester, Pa., and many others have made a splendid success.

The Andrus Press, Clay Crushers and Pulverizers can be seen in operation at all times at Our Factory.

Send for descriptive circular and reference, address

H. O. WHITNEY, Gen'l Agent,

General Office and Factory, KEOKUK, IA. (Mention the Clay-Worker.) KEOKUK, IOWA.

St. Louis Iron and Machine Works, Iron Founders and Builders of Heavy Machinery.

ESTABLISHED 1854.
INCORPORATED 1875.

Office and Works: Main St. and Choteau Avenue,

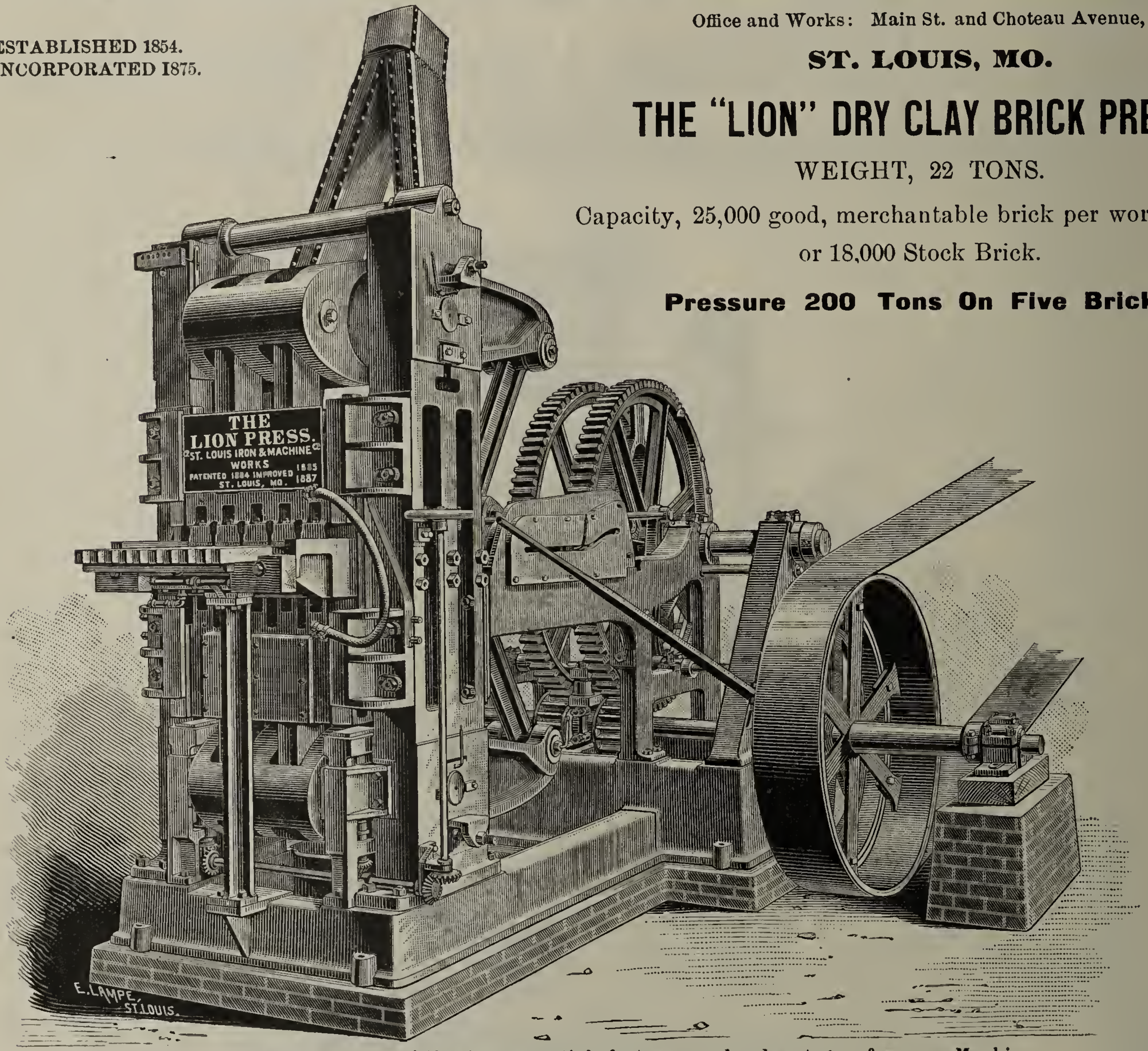
ST. LOUIS, MO.

THE "LION" DRY CLAY BRICK PRESS.

WEIGHT, 22 TONS.

Capacity, 25,000 good, merchantable brick per working day, or 18,000 Stock Brick.

Pressure 200 Tons On Five Bricks.


THE
LION PRESS.
ST. LOUIS IRON & MACHINE Co.
WORKS
PATENTED 1884 IMPROVED 1885 1887
ST. LOUIS, MO.
E. LAMPE, ST. LOUIS.

We claim the following essential features and advantages for our Machine:

1. The main feature of this machine is its great strength, power and durability. The pressure on each brick being 40 tons, and the working parts are so strongly constructed that there is no spring or give under this working strain. 2. The great simplicity and openness of framing and construction, so that every part of the machine is easily accessible for inspection, lubrication and adjustment, thereby reducing the necessary repairs, incidental to every Brick Press, to a minimum. 3. Pressing 5 bricks at each revolution of Machine, keeps the regular force of off-bearers and setters fully employed, which a 4 Brick Machine cannot do. 4. The adjustment of machine from common to stock brick and vice-versa, can be made in a few minutes' time.

Besides the Press, we manufacture and furnish a complete set of clay preparing Machinery, Elevators, Mixers, and Rollers; also Engines and Boilers complete. We also build different kinds of Steamboat Machinery and Stieam Boilers, Corliss Engines, Cotton Compresses, Water Work Plants, Coal and Mineral Mining Machinery, Bridges Work, Hoisting Travelers, Cranes and Elevaters; also general and large castings and Machinery. Any further information cheerfully given.

TESTIMONIALS.

St. Louis Iron and Machine Works, St. Louis, Mo. KANSAS CITY, MO., September 28, 1888.

GENTS: The two "Lion" Presses I bought from you about two years ago have given me entire satisfaction. As a dry clay press I think they have no superior. I prefer the "Lion" to the "Hydraulic". Ever wishing you success with the "Lion," I am,

Very Truly Yours, DRURY UNDERWOOD.

OFFICE OF
TENNESEE BRICK MANUFACTURING CO.,
NO. 7 MADISON STREET, MEMPHIS, TENN., September 28, 1888.

St. Louis Iron and Machine Works, St. Louis, Mo.

GENTLEMEN: In reply to yours of 25th inst., we beg to say that our Company contracted with you last spring for one of your "Lion" Brick Machines, having concluded, after our President and Superintendent had thoroughly investigated most of other machines, including the Hydraulic, that yours possessed more advantages and promised better results. In due course the machine was delivereed, set up and put into operation. After having operated it all summer to full capacity, we are more than pleased with results and can heartily recommend the Machine to any one contemplating a purchase. To fully appreciate the merits it must be seen performing work.

Wishing you that eminent success which you so well merit we remain Yours Truly, C W. EDMONDS, Sec. and Treas.

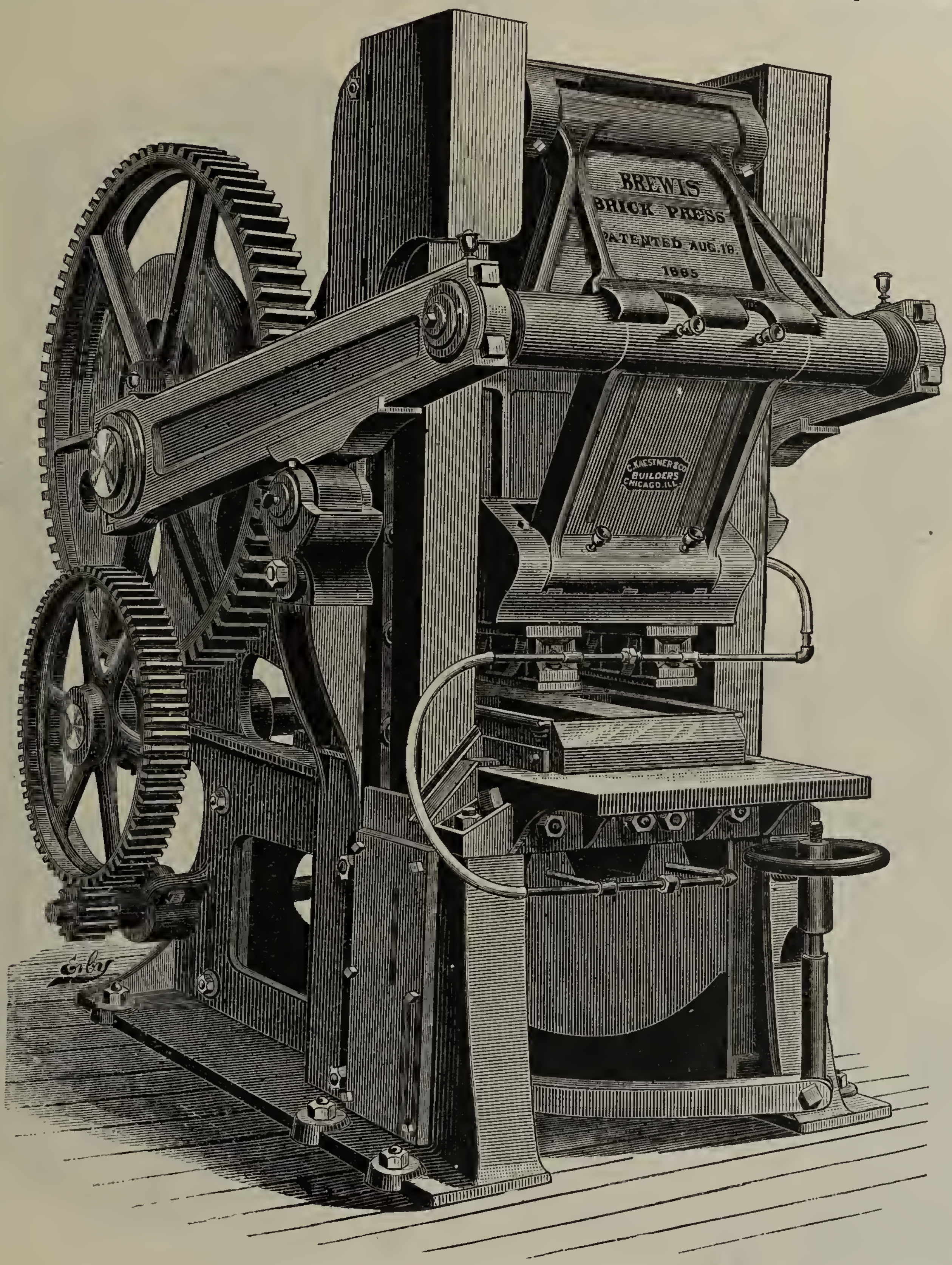
The Brewis Patented Brick Press.

SIMPLE AND DURABLE.

Guaranteed to make as many Perfect Brick per mould as can be made on any machine now in the market. We except none.

Fully covered by patents. **We protect our purchasers.**

Capacity 8,000 to 16,000 a day depending upon the clay



Shipped to responsible parties on 30 to 60 days trial.

Guaranteed against breakage for Two Years.

We furnish the Boyd and Raymond Pulverizers at prices that defy competition. Send for Circulars and Prices to

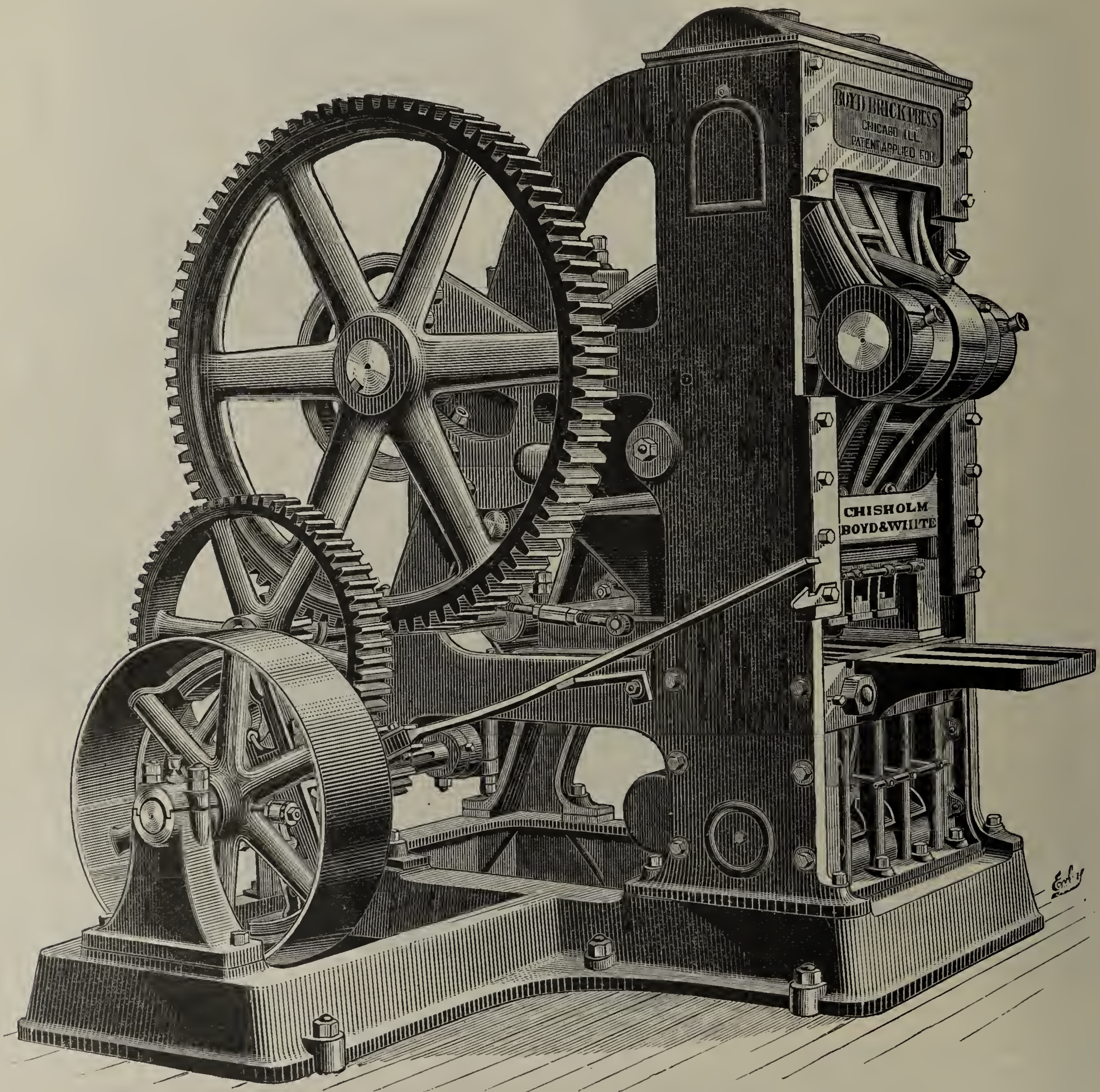
CHARLES KAESTNER & CO., Machinists and Founders,

ENGINES, BOILERS, PUMPS, SHAFTING, PULLEYS, HANGERS, ETC.,

[Mention the Clay-Worker.] **303-311 South Canal Street, CHICAGO, ILL.**

THE BOYD BRICK PRESS

Will make a greater quantity of Perfect Brick (of maximum weight) per mould for a consecutive number of days than any other Semi-Dry Brick Press in the world and Superior in Quality to Hydraulic Pressed Brick.

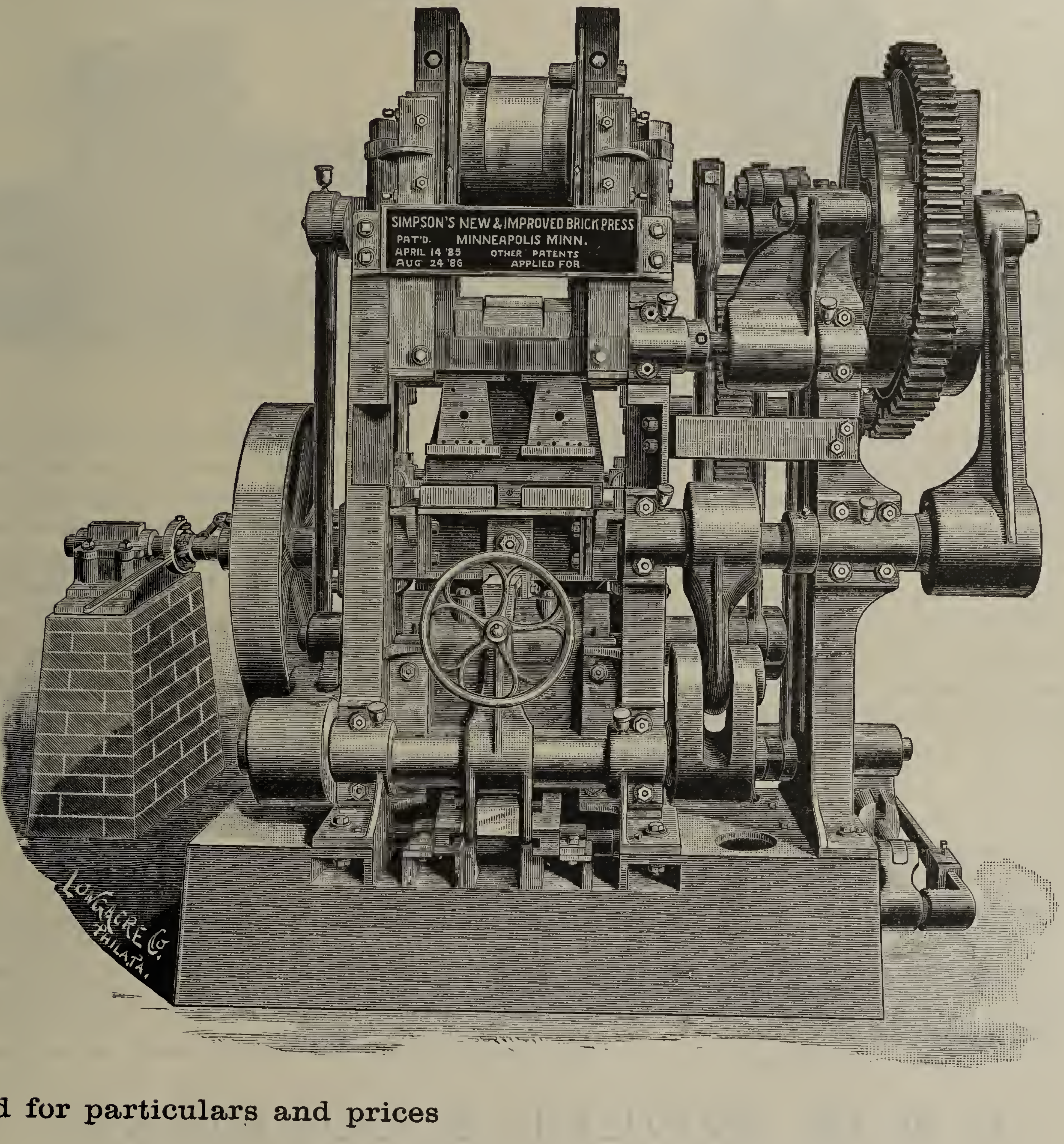


☛ Correspondence Solicited.

CHISHOLM, BOYD & WHITE,

86 Adams Express Building, CHICAGO, ILL.

SIMPSON'S NEW
AND
IMPROVED BRICK PRESS.


SIMPSON'S NEW & IMPROVED BRICK PRESS
PAT'D. APRIL 14 '85 AUG 24 '86
MINNEAPOLIS MINN.
OTHER PATENTS APPLIED FOR
LONGACRE CO. PHILA. PA.

Send for particulars and prices

SIMPSON BRICK PRESS CO.,

Room 91, No. 159 LaSalle, St., CHICAGO, ILL.

I. & M. WOLFF & COLEMAN

THE "IRON CLAD"

STEAM DRIER.

Automatic,

Simple,

Efficient.

Features Radically Different from any other Drier.

Is Broadly Secured by Bona Fide Patents.

Buildings Not Expensive to Construct.

Patentees and Sole Builders

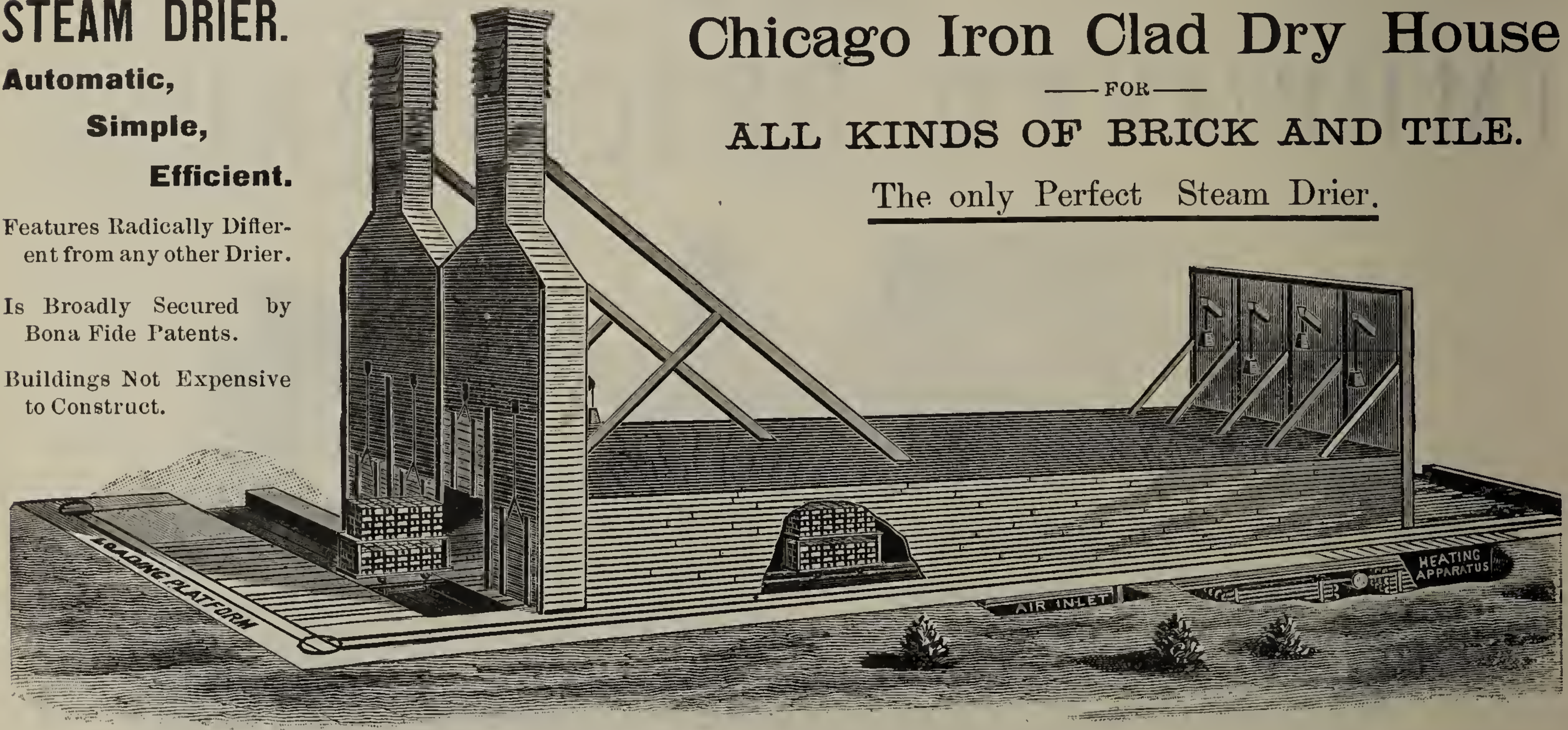
—OF THE—

Chicago Iron Clad Dry House

—FOR—

ALL KINDS OF BRICK AND TILE.

The only Perfect Steam Drier.



This Dry House is a combination of the Drying Floor and Tunnel System. The radiation from the Iron Floor extending over the heating coils dries the lower tiers of bricks. The perforation of the Iron Floor gives an even distribution of the heat and prevents cracking. The steam heat is not so intense as to melt down the bricks or bake them. The bricks are dried uniformly; they come out smoothly and burn evenly, with a good ring. The water-smoke is drawn off rapidly as made and the drying is even and gradual. Stiff mud bricks are baked on double deck cars and thoroughly dried in 24 hours. Soft mud bricks are dumped on pallets and cars carry the same through Dryer in 24 hours. Semi-dry and dry pressed bricks are specially provided for and can be dried without injury. We can convert other Dryers into our system, thereby improving product and capacity. Our buildings are constructed enentirely of wood; are simple, cheap and easily erected. We furnish complete steam heating apparatus with pipes and connections, Iron Cars, Turn-tables, Transfer Cars, Rail and superintendence. Confer with us before contracting elsewhere. We will save you money time and trouble. State character of bricks made, name of machine used and capacity required.

CORNING, N. Y., February 11, 1889.

Messrs. I. & M. Wolff and Coleman,
102 *W. Washington Street, Chicago, Ills.:*

GENTLEMEN—Your Mr. W. C. Byrne arrived here one week ago to see how the Dryer which you people put in for us was doing its work. A part of the time that he has been here the mercury has been 10 degrees below zero and the brick has dried as well as in midsummer. The Dryer, size 28x76, is doing all that you claim for it and we are sure if your directions are properly carried out it will dry more than 20,000 brick per 24 hours. Before we purchased this Dryer from you we visited several places where the hot air Dryers are in use and had partially decided to put in one of them; but seeing your Chicago Iron Clad Steam Dryer, advertised in the CLAY-WORKER, we commenced to investigate the merits of your Dryer. Of course we were told that steam was a failure; but we saw it different and we must say that this Dryer has been put in by you people to our entire satisfaction.

Yours respectfully,
CORNING BRICK WORKS, by C. M. RUBRIGHT, Sec'y & Treas.

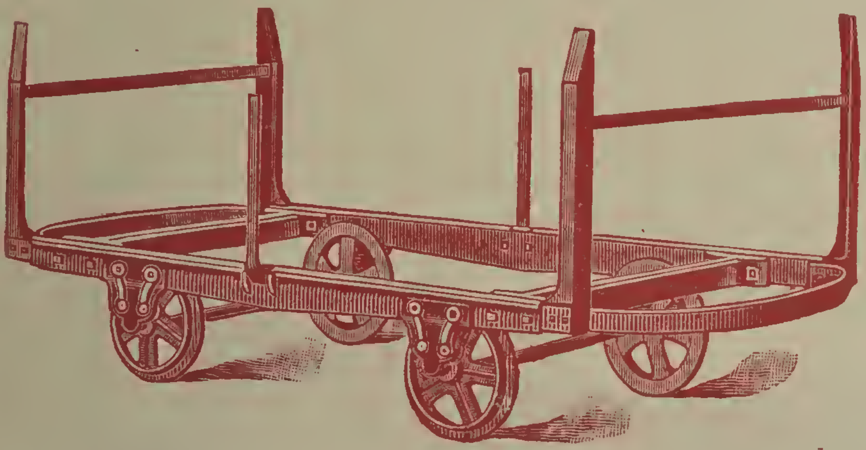
I. & M. WOLFF & COLEMAN,

PATENTEES AND SOLE BUILDERS,

Write for catalogue. **No. 261 Dearborn St., Chicago, Ills.**

The Iron Clad Steam Dryer.

It will pay you to have your bricks thoroughly and equally dried before setting in kiln. You can dry them more economically in our Steam Dryer than in the kiln, besides getting a more uniform burn and better bricks. Handling and wheeling bricks costs money, and the bricks are often marred and in bad shape when they go to the kiln.

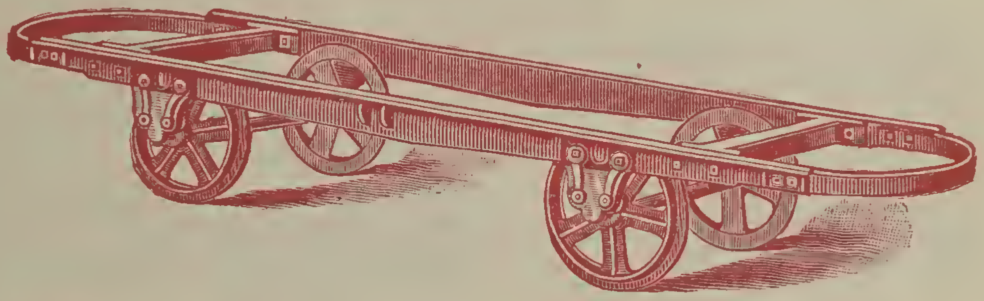

No. 1.

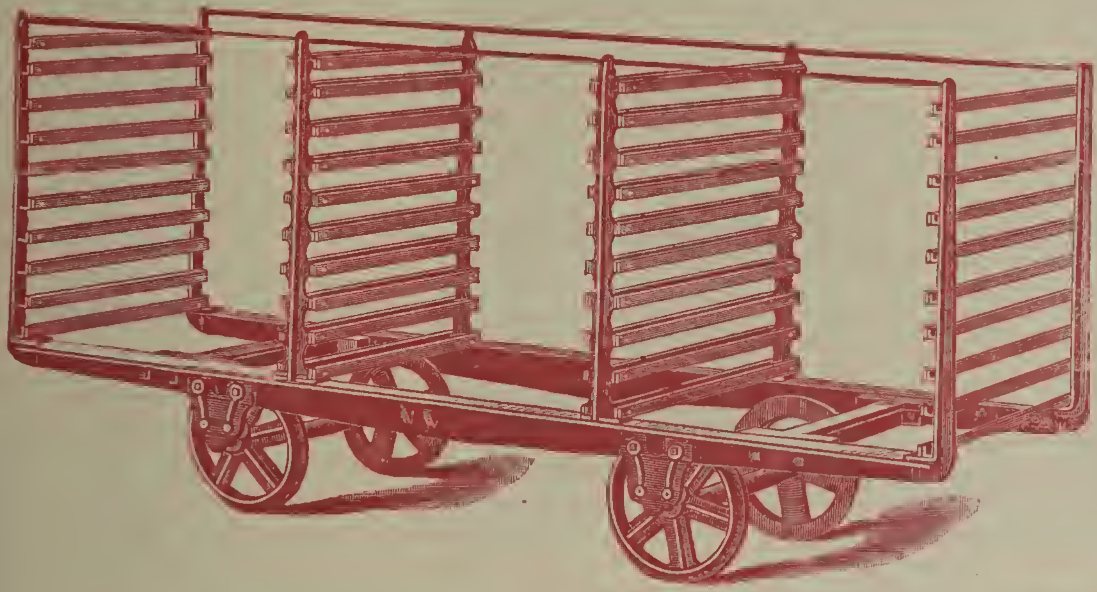
These trucks are strong and well made throughout, and the axles run in anti-friction rollers and are easily handled by one man:

Cut No. 1 shows our double decked car, which we use for all the varieties of brick, sufficiently stiff to be haked; on the lower deck of which we hake four tiers high, and on the top deck five. This car is suitable for all of the stiff mud brick made by the various Die machines. It is also adapted for the drying of dry pressed and semi-dry pressed bricks.

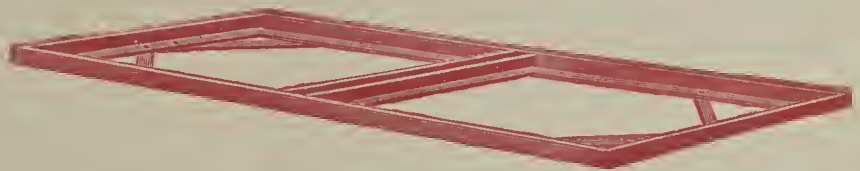
Cut No. 2 is a simple frame car which is used for foot pallets, or this car can be converted into car No. 1 or 3.

Cut No. 3 is for bricks that are too soft to hake and when pallets are necessary.


No. 2.


No. 3.

These racks, together with the car, are constructed entirely of Iron. They will be found strong, light and durable, and afford the best method of using pallets. They do away with the use of the foot pieces on the pallets, which are so much annoyance in handling. The pallets are made to slide upon the wrought iron bars which act as braces for the posts. We make these racks for the pallets to slide in lengthways of the car, so as to bring the side of the bricks towards the heat and also afford conveniences of putting in and taking out the pallets. You can reach across the car easier than lengthways of it. These cars are 8 feet 6 inches in length, and 34 inches wide.


No. 4.

Cut No. 4 is a substantial as well as a light frame—made entirely of wrought angle iron, and strongly braced, which is to be used for a top deck in the car, in cut No. 1.

ADDRESS,

I. & M. WOLFF & COLEMAN,
261 Dearborn Street, - - 14 Third Avenue,
CHICAGO, ILLS.

CLAY DRYERS.

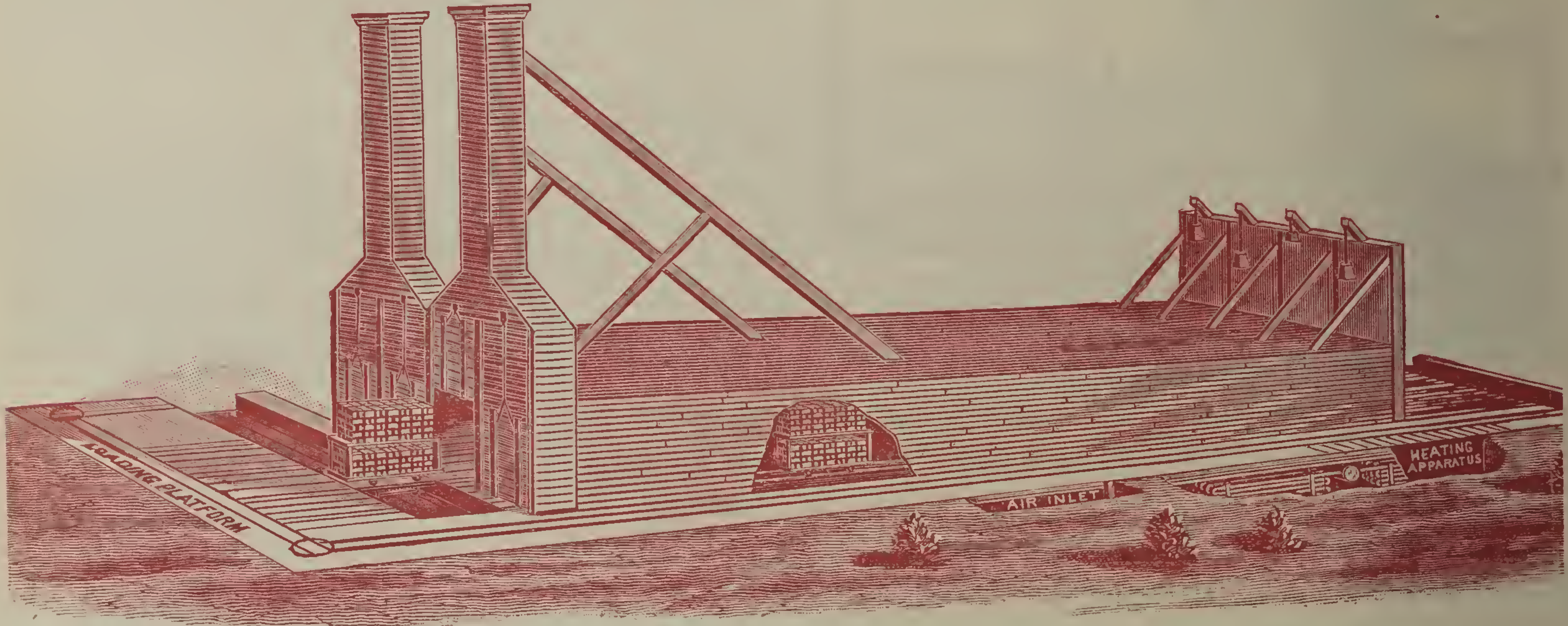
We are prepared to erect Dryers to dry your CLAY as it comes from the pit.

YOU
Save expense of clay sheds.
Work during entire year.
Can always work your clay bank.

NO
Interruptions by rainy weather.
Delays by waiting for dry clay.

Each car carries enough clay for one thousand bricks.

Buildings Cheap to Construct.



BARRINGTON BRICK COMPANY,
(Yards at Barrington, R. I.)
MANUFACTURERS OF FIRST QUALITY
Pressed, Sewer, Building and Ornamental Brick.

OFFICE: { 50 Bromfield St., Boston, Mass.
9 Custom House St., Providence, R. I.

PROVIDENCE, R. I., July 20, 1889.

Messrs. I. & M. Wolff & Coleman, Chicago, Ill.:

GENTLEMEN—We have deferred answering yours as we desired to get a full test of the Dryer, and now will say to you that we have had the Dryer in successful operation for several months giving us a daily capacity of 75,000 bricks. By its use we are not interrupted by weather, and in addition to the money we save in handling, we get a less percentage in breakage than by other methods. We believe that steam heat is the proper principle to dry brick, as it seems to dry more uniform than furnace heat and we can control the draft and temperature better than we could in any furnace dryer. The wear and tear on the Dryer and on the cars is very small in our Dryer and the bricks are in first-class condition, and being well dried, we save time and fuel in shortening our watersmoking. We are more than pleased with the Dryer in every particular and would recommend it to any brickmaker who desires to get first-class results. To fully appreciate this Dryer parties interested should see it in operation, and to any of these we would be glad to show our plant. Yours truly,

W. K. LOGEE, General Manager BARRINGTON BRICK CO.,
Barrington, R. I.

ADDRESS

I. & M. WOLFF & COLEMAN,

PATENTEES AND BUILDERS OF THE

CHICAGO IRON-CLAD DRYER,

261 DEARBORN ST. AND 14 THIRD AVE.,

CHICAGO, ILLINOIS.

THE CLAY-WORKER

Vol. XII. INDIANAPOLIS, IND., AUGUST, 1889. No. 2.

Written for the Clay-Worker.

EXAMPLES OF AMERICAN BRICK AND TERRA COTTA WORK.

No. 18.

The Commercial National Bank Building, Chicago.

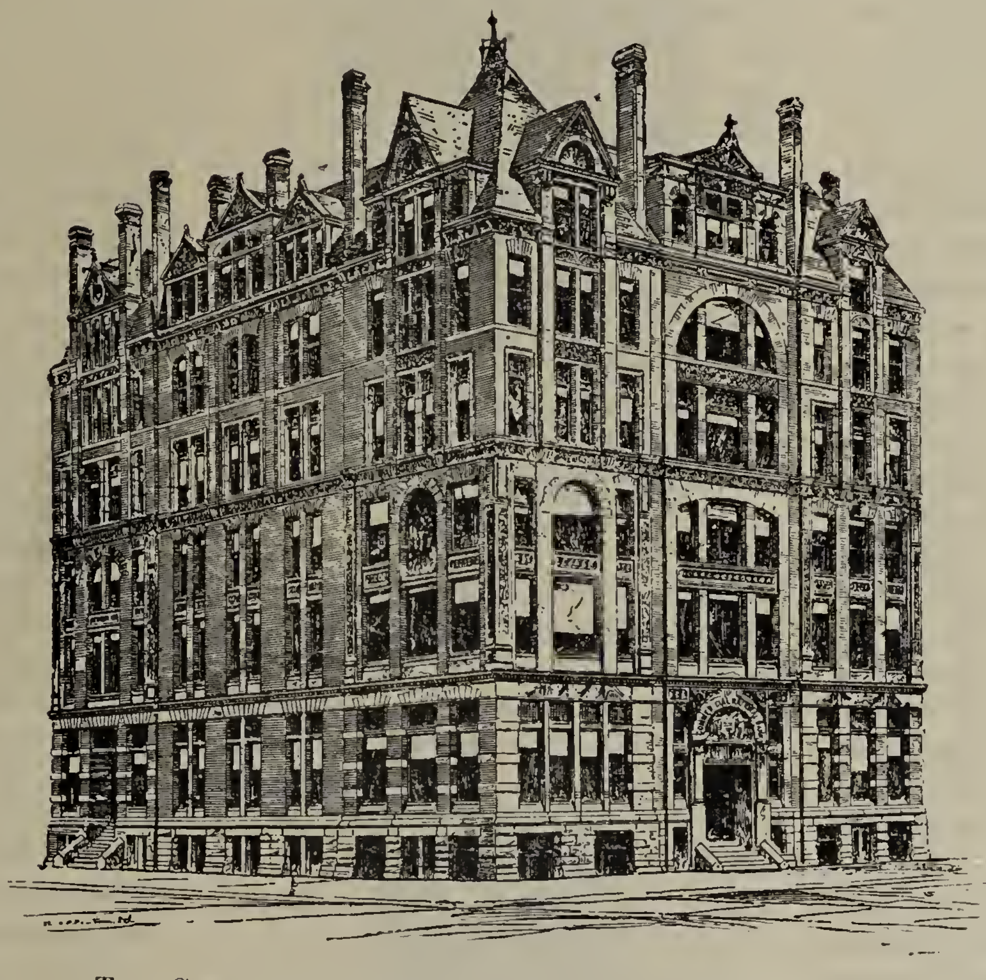
By the recent annexation of numerous suburbs at Chicago is now the second city in point of population in the United States, and in some other respects we are inclined to think that it is a little ahead of its larger rival. Certain it is that no city in the world has ever made such rapid, substantial growth in the same length of time as has this great turbulent heart of commerce during the past decade. Block after block of immense ten to fourteen story business and office structures have sprung up as if by magic, many of them in elegance of finish and appointments being marvels of perfection. In viewing these great buildings those not familiar with metropolitan life can but wonder at the source of such great wealth. Where do all the people necessary to fill these vast structures come from?—How do they sustain themselves and whence comes the almost untold riches? are questions that puzzle the mind and plays upon one's fancy.

Clay workers especially can look upon these modern buildings with gratification for the products of their skill and labor enter most largely into their construction. From the brick foundation to the tiled roof these handsome and indestructible palaces are composed mainly of burned clay.

The subject of our sketch this month, the Commercial National Bank Building, is located at the corner of Dearborn and Monroe Streets and occupies a lot 90 by 131 feet. It is six stories and basement in height, the basement being of blue Bedford stone and the remainder of dark red St. Louis pressed brick with trimmings of Perth Amboy terra cotta.

The first floor is occupied by the bank and presents an exceptionally fine interior designed by the architect, Mr. Scott, of Chicago. The remainder of the building is fitted for offices.

The illustration is by Paul C. Lathrop, from the original design of the architect.



The Commercial National Bank Building, Chicago.

About $800,000,000 were spent in buildings during 1888 in the United States. Judging from present indications, this sum, large as it is, will be exceeded this year by about $1,000,000. These figures are enormous and show to what a great extent the building interests are carried forward. A large amount of this money was spent on buildings that replaced others and for repairs, but by far the greater amount was expended on buildings placed on new sites, thus adding materially to the taxable wealth of the country.

BUSINESS SUCCESS.

John Wanamaker, the millionaire merchant of Philadelphia, the Postmaster General under the Harrison administration, was asked by a newspaper reporter to explain the secrets of his wonderful success. Here is a portion of the response: "Trade is the keenest thing in the world, and it is so because it has to measure with the people. You must have brains and morals to make a great business as well as to make a good character. If a lady comes into my store and says she wants Scotch linen, no clerk of mine is permitted to show her anything else. There might be other goods on which we could make more money, but the clerk must not even mention them. It is our duty to give the people just what they want, and the same prices at the same moment to everybody. There are departments here in which old fashioned goods left on makers' or jobbers' hands by the introduction of new and better goods could be disposed of at snug profits. Some customers would not know the difference in the goods. There are mercantile concerns which make a business of 'working off' these old stocks at retail which wholesalers cannot dispose of, because they sell to merchants who know goods. No such wares will be found in my store. I spend $5,000 a week in advertising, and pay a skillful man—a former newspaper editor, and a good one—$1,000 a month to do it for me. I make money by it. Advertising is the leverage with which this store has been raised up. I do not see how any large and successful business can be done without liberal advertising. Continuous advertising like continuous work, is the most effective."

Written for the Clay-Worker.

OBSERVATIONS FROM A CAR WINDOW

BY PROF. R. T. BROWN.

Modern travel gives but little opportunity to study anything, and even the observations that it permits are made in so hurried a manner that they lose much of their value. I recently made a journey to the northwestern part of Montana, by way of the St. Paul, Minneapolis and Manitoba Railway. This carried me through three or four large cities and over a vast expanse of territory, to conceive the future possibilities of which would tax an imagination much more active than mine. Among my "Notes by the Way," I find some things that may interest or amuse the readers of the Clay-Worker, and so I give them nearly in their original crude form.

CITIES.

Chicago is the wonder of the age. I can see no reason why it should have been built here; or indeed, why it should have been built at all. There was no good natural harbor here to invite the location of a commercial city. Its site was originally a low range of sand hills but little elevated above the lake surface and nearly surrounded by a great marsh. But in spite of all these natural defects, Chicago is a great city—the outgrowth of indomitable energy and untiring perseverance. It is built to stay. What impresses a stranger at first view is the permanent character of the buildings. Since the great fire Chicago, has learned to build with brick; but Chicago is built on faith in it as a great commercial center.

St. Paul and Minneapolis are twin cities, the outgrowth of a great industry stimulated by the enormous power produced by the falls of St. Anthony. The entire volume of the Mississippi River is here available as a water-power, and is chiefly used in the manufacture of flour. By the report of the Board of Trade of Minneapolis, the daily product of these mills is about 33,000 barrels of flour. The Pillsbury Mill, a stone structure, six stories high, makes 7,200 barrels of flour every day. This stimulates every other industry; and though this is a great center of the Northwestern lumber trade, the cities are not built of pine. They are substantially built of brick and stone, the latter material being more frequently used than in Chicago, in consequence of the abundance, and good quality of stone in the vicinity. Excellent brick, however, is made and used here, but the burning has to be almost entirely with wood, which is becoming scarcer every year. These cities, each claim a population of about 200,000. They are on opposite sides of the river and were originally nine miles apart, but are now beginning to overlap. A few iron bridges will make them one.

From Minneapolis to the Red River valley, a distance of 300 miles, the country is in a fair state of cultivation, but the farms generally retain the primitive wooden building, though occasionally we see a modern brick farm house. Judging from the appearance of the clay in cuts along the road, as well as in the brick used in buildings, good brick material is abundant in this region, though fuel for burning is not plenty. Red River valley is the most notable wheat field on the continent, if not in the world. It is about 200 miles long with an average breadth of 50 miles. It is depressed 300 feet below the plain surrounding it, and is elevated only 700 feet above tide water. The valley is devoted to the cultivation of spring wheat and oats. Grand Forks county (the point at which we crossed the river) with an area of 936 square miles produced last year 5,400,000 bushels of wheat and 3,000,000 bushels of oats.

THE PLATEAU DE SIOUX.

Here we enter the Great Plain, stretching westward seven hundred miles to the Rocky Mountains. Our line is nearly along the water-shed between the Gulf of Mexico and Hudson Bay, and therefore we crossed no river of importance for 500 miles. The surface is comparatively level with neither mountain nor marsh in sight and scarcely a tree to obstruct the vision in any direction. The early French explorers called it the Plateau de Sioux because it was the home of the great tribe of Sioux Indians who claimed it and the herds of buffaloes that fatted on it. Small lakes were in sight occasionally, and at long intervals the lonely cottage of some brave man who chooses to endure this solitude for the sake of a home of his own.

The soil is a porous, sandy loam, very productive of wheat, oats and potatoes, but building material or fuel is certainly scarce on this line.

In parts of Dakota south of our line of travel there are beds of coal, but how extensive they are, has not yet been ascertained. Near the western boundary of the Territory I saw one place in which lignite, a variety of light coal, is being mined, but I had no opportunity of examining it. Good brick clay, can, no doubt, be obtained at various points along this route; but whether it would be cheaper to bring fuel here to burn it, or to burn the brick where the coal is and bring it here ready for use, is a question of economy that must be decided. If brick can be made by machinery, on a large scale near the coal mines of Montana, where I examined some promising specimens of brick clay, it will probably be the cheapest building material available in the northern part of Dakota. I neither saw nor heard of any building stone after I left the granite quarries at St. Cloud, in Minnesota, till I reached the Milk River country. At Fort Benton, 40 miles below the Great Falls of the Missouri, I saw portions of the outbuildings pertaining to the old fort, built of unburned brick, yet standing. At the same place, and at Great Falls I saw, in buildings recently erected, specimens of excellent brick, whether judged by hardness or color.

At Helena, building stone is abundant and of a good quality, and most of the better class of buildings are constructed of that material, though brick is being used to some extent. A good quality of brick clay is found in the vicinity of the city, but the scarcity of fuel prevents its extensive use.

Perhaps the largest unbroken area of fertile land on this continent is found on this plateau lying between the Missouri River on the southwest, the Sioux and Red River on the east, the Rocky Mountains on the west and extending indefinitely into Manitoba on the north. This embraces the better part of the two Dakotas, nearly one-third of Montana and an undefined portion of the great northwestern plain of British America. Cultivated to its highest capacity it could supply the bread market of the civilized world, and is certainly destined to take a leading position in the production of all cereals except Indian corn.

But a scarcity of building material and in some parts, of fuel likewise, will somewhat retard the rapid occupancy of this great empire and the development of its rich resources. But the universal distribution of clay is a beneficent provision pointing to the cheapest and best supply of building material. Moreover, the climate demands a building that will shut out the blizzard and economize the heat derived from a scanty supply of fuel. Coal transported 100 miles or more to burn brick will make an expensive house, but when it is well constructed, the pioneer has secured comfort for himself and family, and for posterity, indefinitely—a home. But we are nearing the period when brick will become a commercial article, and the man wishing to build, in town or country, will order brick as he orders other supplies from the market. When an article is produced by hand labor, it is supplied as custom work, when needed; but when expensive machinery is employed in its production, the product enters the market as an article of commerce, securing, generally, a reduction in price and a greater uniformity of quality.

Written for the Clay-Worker.

HINTS ON BRICKMAKING.

No. 38.

BY "R. BRICK."

SETTING BRICK IN KILN.

By special request I again take up the subject of setting brick and reproduce the illustrations used in a former article on this subject.

All brickmakers recognize the importance of properly burning their wares. This cannot be done, however skillful the burner may be or how good the kiln, unless the bricks have been properly set in the kiln; and much of the bad burning is due to ignorant or careless setting of the bricks. A slight obstruction will change the course of heat, it being most sensitive. It is necessary that the spaces left for draft be as nearly as practicable uniform through the kiln. Where they are set three over three, or eight over eight, the setter has a guide, and only by carelessness can he go wrong, but in the setting of the benches and overhanging courses he has no such guide and must use his skill.

Most setters hack the brick in the benches, that is, break joints. This is, I think, a mistake, as it prevents the heat from moving upward, from the benches to the body of the kiln, so that all the heat must pass through the overhanging courses to reach the body of the kiln.

The benches should be set so that the heat can get into them from the arch or fire flue, and be able to pass freely from the benches directly upward into the kiln. I will illustrate my idea by the following diagram :

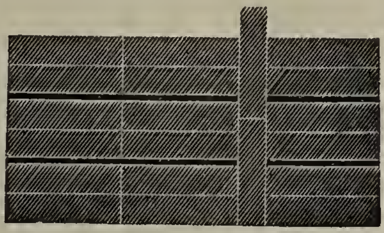


Fig. 1.

Fig. 1 represents ground plan of the bench, between eyes or arches of kiln. This is a three-brick bench with a stretcher between, known as a three-and-a-third-brick bench. The bricks are set in pairs as shown.

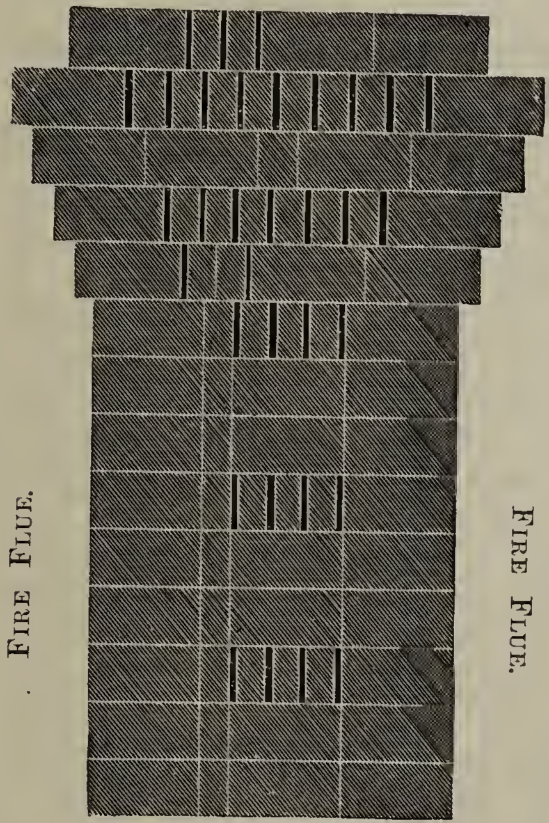


Fig. 2—Elevation.

Fig. 2 is the elevation of end view of bench, showing stretchers in third, sixth and ninth courses in middle course, up to overhangers; then each alternate course in middle between overhangers is stretchers.

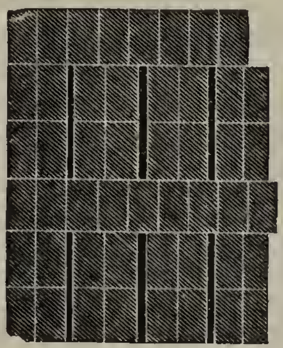


Fig. 3—Elevation.

Fig. 3 is elevation of bench next to fire flue or arch, showing first and second, and fourth and fifth courses set in pairs, one directly over the other.

This shows only six courses. I think it better to set nine straight courses as shown in Fig. 2, the third, sixth and ninth courses tight as in Fig. 3, the third, sixth and ninth courses in middle bench, which are on a level with tight courses in bench next to fire, are set stretchers as shown in Fig. 2. This allows the heat to pass horizontally into middle bench, then vertically between the pairs and through stretcher courses into the kiln; when they are set in pairs they have one straight face. The stretcher between the courses from bottom to top prevents the fire from running from one arch to the other, as it will do when one arch is hotter than the other, but still allows sufficient circulation of heat through the bench. There is but one tight course above the bench, that is the binding course, which is immediately over the closing courses—one-half resting on each course. This is set tight only on the "quarters" of the kiln and loose next to the wall and through center of kiln. I think in setting above the arches they should be set with a little space for draft next to the wall and across each end. Set top course same as the balance, and use two courses flat, on top bottom course, crosswise of top edge course and one inch between bricks—top course to be of good square burned bricks crosswise of bottom course and close together.

This plan of setting the arches can be adopted without the stretcher, that is, it can be a three-brick bench instead of three and one-third, and will carry the heat from the arches freely to every part of the kiln, as well with or without the stretcher shown in Fig. 1. After twenty years experience in setting and burning brick, and after trying many ways, I believe this the simplest and best plan to preserve the shape of the bricks and to allow free passage of heat from arch to bench, and thence upward into the body of the kiln.

These cuts were shown in October, 1887 No. of the Clay-Worker. I have received several letters from parties who have adopted this plan and always with good results.

The spaces between the piers in the bench should be five-eighths of an inch, also between stretchers shown in Fig. 2. The spaces between brick in overhangers should be at least one-half inch. The first overhanging course should be carefully spaced, the others are regulated by the first.

The header back of overhanger should be exactly even with it so that heat can pass horizontally, two lengths of brick then up between stretcher course.

The plan if tried should be followed strictly, to get the full benefit of it.

Written for the Clay-Worker.

BRICKMAKING AND BURNING.

No. 5.

BY J. W. CRARY, SR.

In my former articles I have given some general directions about selecting clays for brick and for preparing them and making and burning them into brick.

Most writers (not excusing myself) are egotistical, vain and self conceited, and the *wear* and *tear* of pronouns of the first person singular, is dreadful. Still "I," "me," "myself" at the right time and in the proper place, makes a better show for true energetic and forcible manliness, than "he," "we," "they," "it," with a vain pride for fastidious modesty. You always know where to find "I" but "he," "we," "it," and "they" are sometimes awful dodgers.

I will now state a fact which I defy any experienced clay hunter and worker to deny, and as I cannot very intelligently explain it myself, I will call on some professor, who can give you all you want to know about brick, (whether he ever saw a kiln made and burned or not) to solve this question. I have never seen a clay bed East, West, North, or South, upon which a variety of timber grows but what will make good brick. It will not crack in drying or check in burning, and generally, will burn red color. I have never seen a clay bed where there is or was no other timber than oak or pine, but what would crack in the sun when molded soft and easily check in burning. Will some facile, juvenile, versatile writer tell me why?

When I speak of clay on the surface where any timber grows of course no reference is made to antediluvial or primitive clay, or what is commonly called fire clay or potters clay, nor do I refer to alluvial clays, such as are found on the low banks of the Mississippi and other rivers, but such as are found on the plateaus or table lands of our rivers and valleys. Most of these lands have a variety of timber on them.

Oak and pine clay lands, have generally, a large proportion of calcareous matter. Traces of fossil shell fish may be seen in the pine or oak clay lands of the South, especially in Alabama or Mississippi. These clays dry fast when moulded soft and shrink more than other varieties, and being poor in silica and rich in lime the particles have not time to arrange themselves into a solid crystal while the water is evaporating.

As a proof of this theory, if we add sand, say one-fourth or less, as the case may be, we find no cracking; if we dry the brick under sheds we have good, strong, whole brick; if we press the clay dry when well pulverized, we find no cracks, but a good, strong brick, if properly burned. This kind of clay should have as much sharp, clean sand added to it as it will bear and make a good brick, unless it be manufactured by a first rate dry press machine.

BURNING BRICK WITH COAL DUST OR OTHER FUEL MIXED WITH CLAY.

A few years ago, (and I presume the practice is continued) nearly all the brick made on the Hudson River, N. Y., and Raritan Bay, N. J., were made of tempered soft clay, and from three pecks to one to two bushels of fine coal dust was tempered in with each thousand brick. The brick to be set around on the outside, and "heads" of kilns had double the quantity of dust. When a kiln was ready to fire, wood was used sparingly and when the arches became hot enough to ignite the coal in the brick, very little wood was used and the doors were kept closed, with just enough air admitted to keep up combustion. The heat would follow close after the water-smoke and the top of the kiln would be harder than the bottom.

A CHEAP BUT BAD WAY OF BURNING BRICK.

The brick burned with coal dust tempered in with the mud or of clay containing lignite, (as is used extensively in Middlesex Co., Raritan Bay, N. J.) are of inferior grade. First, the water-smoke is driven off too rapidly, warping, checking or water-setting the brick. Second, the inside of the brick becomes fused, while the outside is partly chilled and remains comparatively soft. Third, the brick are discolored and have a motley appearance and the grain or texture of the brick being uneven and entirely dissimilar, it is liable to chemical and and atmospheric action.

The difference between the intrinsic value of a thoroughly and evenly burned brick, and one that is half fused and half burned, cannot be compensated by any kind of economy in fuel or burning.

When all architects and builders get to know a brick the man who can burn a thousand brick with three pecks of coal and a wheelbarrow load of wood or 25 cents worth of gas, will be out of a job and good brick burning will take high rank as a profession.

I have not a doubt that the time will come after our natural fuels have been much or nearly exhausted, when heat for burning brick and for many purposes not now thought of, will be developed from water power and electricity.

The dynamic forces of these elements can be cheaply transmitted from the ebb and flow of tides as a motor and from the water powers of streams to the whole country, but the clay worker need not be troubled about that just now, especially in Indiana, so long as your great subterranean gasometer will supply you; but look out for an explosion that will fearfully diminish the Hoosier population, when you get out enough of that gas to let in a certain quantity of air. I would advise you to insure the Clay-Worker, sometime within the course of fifty years, provided, you have an Earthquake Insurance Co., and I think you will.

I have said in my former articles, that clay that will crack in sun-drying should be tempered in a pug mill, water being added to it only one time; that clay which is loamy, or charged with sand so as to make it short or weak, should be tempered in a pit and worked until it is stiff, then watered; this process of tempering and watering should be continued, until the clay particles become so disintegrated that the whole body feels plastic to the touch. Millions of good, fair building brick, are made on the river bank at New Orleans, La., in this way, of the deposit of sandy mud or battue. It is taken out when the river is low and kept in store for spring and summer use, and the next succeeding high water replaces the mud taken out, so that the excavation is not seen. Thus the great "Father of Waters" carries on his work of alluvion, which has furnished mud for brick, and millions of fertile acres for agriculture.

BURNING PLASTIC CLAY BRICK AND DRY PRESSED CLAY BRICK.

I have already given some directions for burning and setting brick. In my former articles of this series, I stated that there was a material difference between the right way of burning the two kinds of brick above mentioned. A mud brick having much more water to evaporate than a dry pressed brick, when dried off, will, of course, be more porous than a dry pressed brick, and will absorb heat more rapidly. If, therefore, the two kinds of brick are set in one kiln separately, it will be found that the mud brick will be dried off and the fires up sooner than the dry pressed brick. It is therefore evident that the dry pressed brick should be fired slow, steady and carefully, for if fired to keep up with the mud brick they will expand or swell so as to partially lose the cohesive attraction the particles of clay have assumed under pressure. This is of the first importance for if the cohesiveness of the particles of clay be once disturbed, nothing can restore it.

BURNING DRY PRESSED BRICK DIRECT FROM MACHINE.

If your clay has been dug and hauled when dry as it naturally gets in the bed, and stored under a good shed, it will be in good condition to press after three or four weeks under shed. It will get but very little dryer under a shed than it was in the bank, but it will be uniform in dampness and mulled, ready for the pulverizer.

Clay in this condition will be dry enough to go at once into the kiln from the machine. Brick can be well burned if dry enough to stand in a kiln without crushing, provided they are evenly well set and the firing very slow and careful. If the clay be frozen when pulverized in a so-called dry state, it may be pressed and set directly into the kiln, but if pressed damp without being frozen, and then frozen, it will not be a brick when thawed, but a crumbling body of clay, unless kept frozen and exposed to the air a long time. Dry pressed brick should be set even and open. A good and safe rule is to set five on edge, on the distance or length of two, or say three-quarters of an inch apart. As I have said in previous articles, the benches and overhangers, should be set skintling or diagonally across, one or two in form of letter X. This should continue until the binders are on and ready for first running, or lengthwise course across the kiln. For common brick I prefer to set skintling all the way to the top. If set even this way the circulating draft and flame is more regular and diffusive. It requires more skill to set skintling, but a setter can set much faster. When a kiln is set skintling the course of draft up through the kiln is serpentine, and the circulation of heat is more lateral, and better distributed than when the brick are set transversely, three over three. The benches of a dry pressed kiln may be a brick wider than for mud brick, as the clay, dry pressed, will stand more fire. Five courses wide will do well with good burning. Forty brick high is a good maximum for setting a kiln. The width may vary but I prefer a narrow kiln, not over 24 feet wide. The fires can be worked and controlled well in this width of kiln.

I have spoken of fusible and infusible clays, and have shown that the infusible clays will not shrink or settle by burning, and that the fusible clays will stand fire better by being dry pressed. When a dry pressed kiln is ready to fire, if with wood, the greenest, or if all dry, that which has the least resinous matter, should be used first, for if much black smoke passes up through the kiln when cold, it will coat the brick in spots. This not only chokes the draft, but is a nonconductor of heat, and what is called a chill or cold spot is likely to ensue. This is not infrequent with ignorant burners; some call it "witch in the kiln" I have seen them dig to the arches to get it out, but the best way to get the "witch" out, is to pour water enough down from the top, to start hot steam from the hot arch, then it will follow up by pressure of steam. But this witch must be prevented by a very slow and clean fire. If coal be used, hard coal is best for drying off; bitumiuous coal is best after the kiln is hot. When the fires are all out at top, the heat should be increased until the overhangers show signs of fusion or glazing; then this heat should be kept steady, until it appears on top. In clays that don't melt by heat or settle, the the platting will first show a white sulphuret of any alkaline matter in the clay. Then as the intense heat appears under the platting, a sulphuret of iron, or what burners call "brown sulphur," will coat the edges of the platting. This is a sure sign of hard brick from bottom to top, as all the mineral substances of the clay have become completely oxidized. This efflorescent appearance of oxidized substances in clays is the true indication of the quality of a burn, and not the settle, as common brick burners believe. If clay melts at a low heat, as soon as the arches get red hot, the danger of fusing may be very much prevented by closing the kiln up tight for five or ten hours. I have closed a kiln at 9 p. m. and opened it at 6 a. m. and found it in good order and very hard to melt afterwards.

Reason: The alkaline salts have been greatly dissipated and ceased to be a ready flux with the clay under a high heat. Thus closing a kiln to let it "cook," is not only good to prevent fusing, but it is the only true and sure way to get out a cold spot or "witch." After closing a kiln tight for eight or ten hours, when re-opened the draft will be very strong and so equalized that all cold spots will disappear.

Written for the Clay-Worker.

SEWER PIPES AND THEIR MANUFACTURE.

BY ALFRED CROSSLEY.

My esteemed friend, the editor of this excellent paper, some months ago requested me to write an article for these columns, on any department of fictile productions germane to the scope and province of this Journal. I regret that my promise then made has been so long in being fulfilled, but my time has been so fully occupied as to leave me little leisure for writing. The subject I have chosen for this article is "Sewer Pipes," not because I feel qualified to do the subject justice worthy of its importance, but because in our trade papers it has received comparatively little attention, and hence some remarks upon it would doubtless prove interesting. At the outset I will say that I do not claim absolute accuracy for everything I may say, but as an Irishman always has the privilege to speak twice I suppose an Englishman is near enough neighbor to be allowed the same, and if any inaccuracies creep in I am ready to "stand corrected." Further, it is difficult to treat on any subject without getting on somebody's corns, or crossing their pet theories (we all have them), therefore don't let some brother say, "that fellow is a crank," just because I give expression to some opinion that does not exactly "hitch" with his. I have no intention, and lack the necessary ability if I had, to write a treatise on sewerage systems as such, for that requires an amount of scientific knowledge not to be expected of the average citizen, but it would be impossible to write anything on the subject in hand without making some reference to the system which sustains it. Sewerage of course is older than the sewer pipe, so also is travelling older than the locomotive, but in the one case as in the other the association of ideas is inseparable. The importance of a proper system of sewerage can hardly be overestimated. Indeed without such the association together in towns and cities of large communities of people with any approximation of continued health would be an impossibility. And yet where this subject has received proper attention even the largest cities are often more healthy than many rural districts. The city of London itself with its 5,000,000 people is shown by statistics to be healthier than many towns of not over ten or fifteen thousand. The importance so justly attached to this subject is shown by the immense works undertaken by our large cities and the large expenditure of money involved. London commenced her sewerage systems in the year 1531, and from the latest accounts I have read has now 2300 miles of sewers, varying in size from 9 inches to 12½ feet in diameter. The main sewerage scheme, completed and put into operation in 1870 and 1871 footed up a total cost of $150,000,000. New York has 314 miles of sewers; Brooklyn about 300 miles, of sizes from 12 inches to 10 feet diameter, and costing about $8,000,000. Providence, R. I., has about 42 miles of sewers, 27 of pipe and 15 of brick, from 12 inches to 5½ feet diameter, costing about $1,500,000. Chicago has about 350 miles of sewers, from 12 inches to 9 feet in diameter. Philadelphia has about 300 miles of sewers before the adoption of their new system, which cost about $10,000,000. I have inserted these statistics regarding a few of the prominent cities to give some slight idea of the immense interests directly associated with this industry, which, as it regards the health and well being of the nation is second to none in its importance.

The great interest taken in sewerage works and improvements in recent years both in Europe and America, and the consequent impetus given to the industry now under discussion, cannot properly be classed under the head of modern inventions. It is only a revival and modern application of principles that were well understood and practically applied in ages long past. In fact the early history of sanitary science is veiled in antiquity. The plan of carrying away the filth of a city by underground sewers is very ancient. The temple of the city of Jerusalem had a very perfect system of sewerage, cut out of the solid rock, which is yet in as good a condition as when first constructed. Alexandria, Carthage, Herculeum, Nineveh and Rome had complete systems of sewerage and water works. Says another writer: "The water works and sewerage systems of Carthage, Alexandria, Rome and Jerusalem were both extensive and complete. The Cloaca of Rome has been continuously performing its present duties for about twenty centuries. There are other convincing proofs that at one time in the early history of the human race the art and science of efficient sewerage was well understood by the people of the far East, even as early as the beginning of the Christian era.

If we could find any authentic records of the very first attempts at sewer construction we should probably find it to have been of a very crude and primitive nature. Before the art of forming cylindrical tubes or pipes from clay and burning them was discovered, wood, stone, and later on brick were no doubt each in turn employed. But it is certain that the use of vitrified pipes from clay was not very long delayed. Sewers built of them have been unearthed in the excavations of Pompeii and Herculaneum, which cities were destroyed by an eruption of Vesuvius, A. D., 79.

Rev. F. S. De Haas, late U. S. Consul to Jerusalem, writes:

"Vitrified clay is among the most durable materials known. While the marble palaces, temples and tombs of Rome and other ancient cities have crumbled to dust, those built of brick remain almost perfect. The use of terra cotta for images, ornaments, drain pipes, coffins, and vessels of different kinds, dates back to the remote ages. Sewers and tiling used in construction have been found in Pompeii, Troy and Nineveh, also in Ur of the Chaldees, the home of Abraham, and the oldest city in the world. Here it was in general use, and the tombs are drained with clay pipes as sound as when laid in the ground 4,000 years ago. The coffins also are of the same material, and of different shades, some like caskets with lids, and others round like bottles, which were sealed up after the corpse was inserted, and there they are at the present time by thousands sound as when they came from the potter's hands. Nothing is now known more lasting than terra cotta. Whether the ancients knew the secret of glazing their pipes with salt I have been unable to learn, and it may be that we moderns may take the flattering unction to our souls that in the art of salt glazing we have a genuine invention that belongs to our own age."

Sewer pipes are of course in this article regarded as a product of clay, and I suppose no one doubts now that it is by far the most suitable material for the purpose, all things considered. But the modern history of sewerage shows that various other materials have been employed. Chief among these is iron. Iron has considerable advantage in the fact that it can be made in so much longer lengths, thereby having not over one-fifth or one-sixth the number of joints, and also that it is so much stronger. But on the other hand, it is very much more costly, and what is more to the point the action of the acids contained in the sewage is found to rapidly destroy the pipe, hence sewers laid with iron pipes in a few years become eaten through and unfit for use, while well made, vitrified glazed pipes are absolutely indestructible. Of this I shall speak later on. This objection to iron as a material for sewer pipes has long been known and recognized and various attempts have been made to overcome it but hitherto without practical success. Mr. W. Bruce, in a paper read before the Edinburgh (Scotland) Architectural Asssociation in 1889, says: "The earthenware pipe is as clean 30 years after it is laid as the day it was placed in position; whereas iron pipes—be they coated or galvanized, or put through any process yet known to us—are corroded inside and outside in a very few years."

In 1860, Henry Kamp took out a patent for "Preserving Iron Sewage Pipes," but it is evident his process has been a failure.

Besides earthen—or stoneware, and iron, the following materials have all been employed in the manufacture of sewer pipes, viz.: stone, wood, glass, bitumen, slag, paper composition, and cement concrete. The study of these covers the modern history of this subject, represented by a period of about 300 years. Some of these I only intend to briefly refer to, although a detailed account of everything relating to the subject is very interesting.

The earliest record that I have read of is dated January, 1619, where, in England, his master granted to John Etherington—viz.: "A speall priviledge, shewing that whereas he hath found out the arte of making a certain engine to make cast clay, all sorts of earthen pipes, for the conveyance of water in the earth, and also mullions and transomes for windows, crests for houses, tyles and paving stones." This is probably the earliest attempt to make these wares by machinery, and up to this time all such had evidently been hand made.

In 1725 letters patent were granted to William Edwards for the making of earthenware pipes, and from the description given they appear to have been of a superior quality. They were made from 2-inch to 12-inch in diameter, and the joints were exactly turned to be close fitting, and the pipes were jointed with some kind of cement, described to be perfectly hard in water, and when under heavy pressure the pipes were hooped with rings of fire clay or iron, and used for pumps of great depth.

In 1728 a machine was made for the boring of stone pipes from $1\frac{1}{2}$-inch to 14-inch in diameter, and in lengths from 3 feet to 6 feet and it was stated that those stone pipes could be made as cheap as wooden pipes. In 1734 another machine was invented for making stone pipes, and for making marble and stone coffins.

In 1766 Thomas Lindslee described a kind of composition pipe made of certain proportions of different clays, sand, and magnesia, mixed up with water, kneaded and formed in tin or iron moulds, dried and double glazed with a composition of magnesia, red and yellow ochre, lead ore and quartz, and the pipes were encased for burning.

In 1782 a patent was granted to John Gaittait for the invention of a "stink trap," and, while omitting the details of the specification, it can hardly be doubted that this was the father of all the sewer traps that have since been constructed.

In 1798 William Docker described the making of stone pipes for "conveying of water, smoke, steam, and other fluids," and the socket joints were "made so fine as not to admit of being cemented with a substance thicker than paint."

In 1808 William Bell described the making of tubes of porcelain, pottery, and various compositions which were vitrifiable, and those tubes were used for lining the inside of iron pipes, which shows us that in the beginning of the present century people knew how unsuitable iron was for any pipe conveying sewage. This will strike us as one of those utopian ideas that are very beautiful in theory, but entirely useless in practice.

In 1810 Samuel Hill made loose rims or collars for the jointing of stone pipes, described to be fixed on the pipes with cement, and from the same year dates Francis & Waters' patent joint for fire clay pipes. These pipes were made thick at the ends, and grooved for a tongue of soft material. The joints were placed and bedded in a hollow block, and a similar block cemented on the top of the joint. By the specification it is evident that Francis & Waters claimed the right at that time of making pipes of earthenware above 5 feet in length. Claiming the "right," and exercising it however are two different things, and the record does not appear to state whether they actually succeeded in making clay pipes of 5 feet or over in length. If they could do this practically and economically in 1810 our nineteenth century clay workers have made a sad mistake in losing the art in so short a time. It would be a great advantage to have our large sized pipes as long as possible but over a certain length it appears to be attended with considerable difficulty in practice. On this I will speak further in the proper place. In the mean time, however, if our sewer pipe manufacturers want the "right" to make their pipes 5 feet or over in length, I don't think they need trouble to go to Washington or London to get it. Nobody is going to interfere with them in such laudable work.

In 1814 John Read described a superior class of earthenware pipes, made with either spigot and faucet, or flange joints, and after the clay was dried the bore was turned, and the pipes glazed inside, and afterward burnt in the kiln. This shows us that up to this time salt glazing had not been applied to sewer pipes.

(To be continued.)

Written for the Clay-Worker.

COST AND WASTE OF FUEL.

BY PROF. J. F. ELSOM.

According to the best statistical data obtainable it appears that with the best processeses known, the secrets involved in combustion are very imperfectly understood and the very best results I have been able to obtain is a fraction less than eight per cent. of the heat units present in a given fuel are actually made economic; the rest, over ninety-two per cent, being lost to sight, but to memory dear.

In order to bring the matter to an actual mathematical proportion and with no desire to cast reflections on any kiln, burner or process, I will state that a sample of clay of a certain dryness will show by analysis precisely as much heat, actual measurement, is required to eliminate the water of crystallization. This, as I have told you before, is all that burning consists of, for a heat no matter from what source or how applied, sufficient to do this "burns the brick," but, of course, is susceptible of specific modifications when certain results such as strength, color and the like, are desired. Now with this fact of required heat before us, we will take a given fuel, subject to careful and impartial analysis and the results should enable us to fill the kiln and apply a stipulated amount of fuel and the job would be perfect, but if we do this, the results be about one-eleventh of a finish; strange, but not less strange than true.

Last month, I had samples of over fifty clays and I expect not many were to be subjected to the same treatment, tempered or molded, dried or burned with the same appliances, hence I had a good opportunity of ascertaining practical results which will be given further on, at least all my customers who have favored me with a report.

When a sample of clay is sent for analysis, about the first thing the chemist does is to determine the amount of extraneous water the sample contains. There are diverse ways of doing this, but the simplest is to keep at a temperature of 100° C. or 212° F. for five hours. If the clay is finely pulverized this will do it effectually but if this heat is continued until the sample ceases to lose in weight is prima facia evidence that the extraneous moisture has all been eliminated, absorbed or driven off, corresponding to the operations of the dry kilns of the brickyard.

It should be borne in mind in this connection, however, that it does not follow that aggregate time multiplied by the temperature will produce the same results. For instance:

1.....................100°x5=500.
2.....................50°x10=500.
3.....................25°x20=500.

The first statement will accomplish it; the second will partially, while the third will scarcely depreciate weight at all, and outside the influences of temperature (very hot days when no fuel is needed), there is no difference in the cost of producing the foregoing aggregate, though one result will be perfect, another partially so, and the last, practically indifferent so far as efficiency is concerned, but when 25 degrees has been reached, the next number is much easier and cheaper attained, and so on to the highest in arithmetical progression, inasmuch as the original heat units have been practically lost in reaching the first, and but one-half additional loss will be needed to reach the second, and one-fourth the third, and so on.

With these tests suggested, I requested the manufacturers to make a few bricks, get rid of this extraneous water in any way (the easiest way is by means of the water bath; boiling water being at about the required temperature) burn them carefully according to rule and report results, and this is how the letters read:

Heat required.	Heat used.*	Time.
1. .3916	31.082	12 hrs.
2. .4681	47.188	13 "
3. .2721	33.929	12 "
4. .3644	38.888	10 "
5. .5885	62.789	11 "

6.	.3023	38.229	15 "
7.	.7654	75.722	18 "
8.	.5105	56.626	15 "
9.	.3333	41.010	17 "
10.	.2702	31.313	10 "

*Good hard brick of even color followed each test.

Of course it cannot be expected of me to give instructions how these results were estimated in figures, as these gentlemen purchased this knowledge and is no more my property than a load of brick I might sell, but is sufficient for present purposes. These brick burned without water-smoke. Why? Because the surplus water present in the clay had been gotten rid of and different fuels were used—wood, coal, oil, peat, gas, both natural and artificial, and mixed fuels, all the restrictions I placed was a crude test for examination of the brick while being burned when they responded to this they were removed from the fire and buried in sand to cool off without absorption.

It will be noticed that certain results and requirements were reached at different periods of time, no two, so far as reported, working alike, not only as required by my laboratory test, but they carry with them no rule of proportion upon which a general rule can be based, proving conclusively as I have argued in the presence of many of you that no two banks, aye kilns from the same bank, can be treated in accordance with any proscribed inflexible rule, but must be governed by season, temperature, condition and other contingencies well known to most of my readers.

All the melody of machine and kiln men cannot drown the "still, small voice" that came piping from the demonstrations, but like Banquo's ghost will not down. They teach first that there should be no water-smoke issuing from the burning kiln; further, that when the brick are placed in the last or burning kiln before this extraneous water has been gotten rid of, at least five times the heat is required at the ordinary temperature of burning to drive off than at the temperature suggested, for the reason that when one brick does become dry, it is in just the right condition to absorb the steam and moisture from those not thoroughly dry. The same difficulty is apparent when the bricks are hygroscopically unlike.

Just here is a point I would like to make regarding the "blushing" of brick in certain portions of the burning kiln, but as I do not wish to exceed my limit of space, I will be forced to leave this for another time, suffice it to say that I hope to have the requisite data in a short time to prove that the presence of this extraneous matter, water, in the brick when the fires are started is actually responsible for these parti-colors in the burned brick more than all other things combined.

A certain style of shoe button is called "Old Maid's Wedding," because it never comes off.

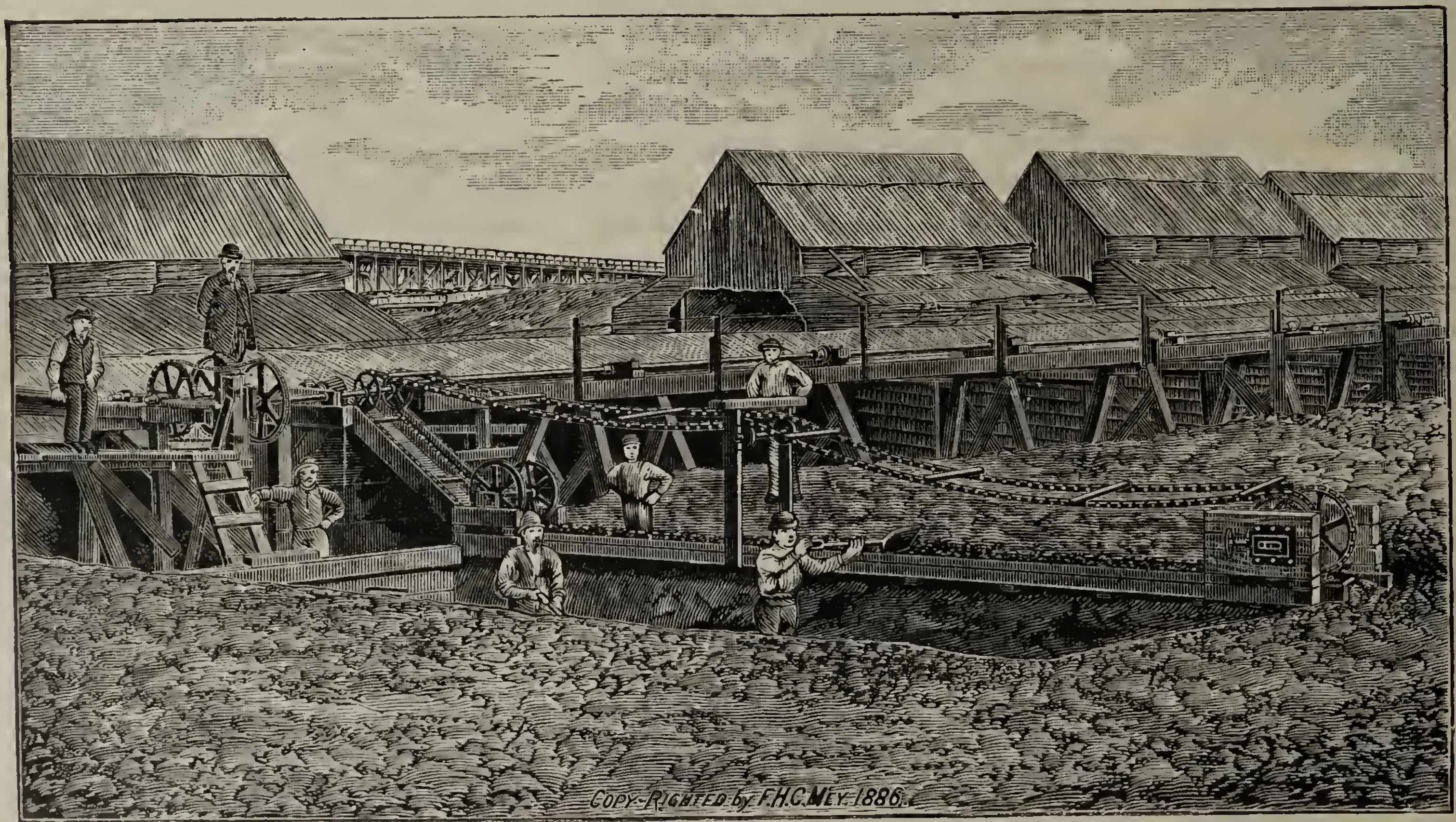
MEY'S CLAY ELEVATORS FOR ELEVATING WET OR DRY CLAY.

The method of conveying clay from bank to machinery which is here illustrated has been in successful operation at various places for several years and has proved very economical and efficient.

It dispenses with the old method of shoveling or wheeling from the pit into the machine, an advantage that will be appreciated by all practical brick manufacturers.

The conveyor will take the clay from the bank, though it may be a long distance from the machine, and deposit it directly in the machine, thus requiring but one handling.

Where soak pits are used the Elevator can be set at any convenient place and the pits dug on one or both sides as may be desired. This does away with building a raised platform or pit back of the brick machine, thereby saving more than the cost of this Chain or Cable Elevator and being on level ground it is much easier to fill the pits where the clay is hauled in carts as the horses can draw heavier loads with less effort. If there is a pit on each side of the Elevator they may be filled and emptied alternately, enabling the operator to run the brick machine every day. It requires but little power and will elevate the clay as fast and in just such quantity as wanted. The pitmen can also handle more clay with less labor by using this Elevator than by the old way of getting clay from soak pit into the machine.


COPY-RIGHTED BY F.H.C.MEY-1886.

MEY'S CLAY ELEVATOR AND CONVEYOR.

Different kinds of clay may be mixed more readily and thoroughly by this method as the light clay can be put in one part of the pit and the strong clay in another and if there are two pitmen one can handle the light and the other the strong clay, both going into the machine at the same time and in the proper proportion to insure the best product. Mr. Mey, the inventor of this system, has devoted much time and study to this subject and maintains that it is in several respects superior to any similar device. Those interested can obtain further information by addressing the manufacturer, MR. F. H. C. MEY, 64 and 68 Columbia Street, Buffalo, N. Y.

BRICKMAKING AND MOSAICS IN CATALONIA.

The United States consul of Barcelona, in his last report, says that hand moulded bricks occupy, beyond all dispute, the most important place among the various industries comprised under the general denomination of ceramics, both on account of their numerous and important applications, as well as of the large number of laborers employed in their manufacture. The process is of the most rudimentary nature, both as regards the moulding and the baking. The moulding is done on a large uncovered brick floor, where, in the event of a fall of rain, the work of many days would be ruined and rendered useless. The baking is performed in ovens constructed near the moulding floor, the intermittent system being employed. The importance of this industry in Catalonia is very considerable on account of the large exportation of the articles to the island of Cuba, where, however, special shapes are required. The process of manufacture consists in a rough sieving of the clay, which being kneaded, is placed in wooden or iron moulds. This, as before mentioned, is done on an uncovered brick floor, where the moulded bricks are left until entirely dry, being frequently turned to obtain this result as quickly as possible. When dry they are carried to the ovens, where they are piled in castle shapes, with intermediate spaces sufficiently large for the free access of the flame to all parts of the pile, thus producing an even baking of the bricks. Besides the common type of bricks, others are occasionally made and baked in the same oven, especially those called Roman tiles. These, which were formerly used throughout the country, are now everywhere discarded on account of the cheapness and lighter weight of the mosaic tiles which have taken their place. A short time ago the manufacture of floor bricks constituted a very important industry in Catalonia, and although now, on account of greater exactions of style and luxury, it has somewhat lost ground, it still holds a high place among the Catalan industries. The bricks, which are 5½ inches square, are of two kinds, white and red. The clay used is of the best quality. The kneading of the clay, which is done very carefully and completely, is performed by hand, as is the case with the moulding and cutting of the bricks into their definite shape. The bright red color is obtained by applying before cutting a bath of barbotina (worm seed) to the bricks, selecting for the purpose a special kind of clay, very plastic, of a bright red color. The floor bricks which have acquired the most fame abroad are those manufactured at La Brisba, a small town near the city of Gerona, where the clay is of a particularly excellent quality. The manufacture of machine-made tiles is considerably developed in the province of Barcelona, where two important factories turn out a large amount of work. The material used is a plastic clay or marl of a yellowish color, which, after a thorough baking, whitens considerably. Formerly the clay used came exclusively from the mines of the towns of San Saturnino de Noya and Gelida, about thirty miles from Barcelona. The clay is powder having been sieved, is kneaded by means of an apparatus with blades disposed in screw shape, whereby the cake is obtained out of which the tile is manufactured. The moulding is performed by means of a pressure machine, the main feature of which is an iron cylinder of hexagonal shape, having on each face the shape of the upper side of the tile, and against which, on revolving, a workman applies a cake of clay, a definite shape being obtained from the matrix, which contains a mould of plaster or delf with the imprint of the lower side of the tile. The tiles, after being dried, are piled in the oven and baked. In one of the large factories in Barcelona there are two large continuous furnaces (Hoffmann system); in another they bake their tiles in square ovens where fire is used intermittently. Both factories use hard coal for fuel. An important industry, not so much on account of the number of usages to which they are dedicated as for the great number manufactured, is the making of glazed bricks for kitchens, the shape and condition of which in Spanish cities is well known to consist in a number of small iron furnaces or grates, at a certain height from the floor, set in masonry, to cover which the above mentioned bricks are used. These, the manufacture of which is almost exclusively confined to Catalonia, are used throughout Spain, the Philippine Islands, and the Spanish colonies in America. In mosaics there are two distinct kinds, both used as flooring, one of which, the older, is obtained by the juxtaposition of numerous pieces of geometrical shape, and each of a different color. The inconvenience of this kind of flooring consists in the difficulty in making surfaces perfectly smooth on account of the different thickness of the pieces, and the fact that as soon as one piece is out of place the whole flooring requires resetting. Nevertheless, at one time the manufacture of this kind of mosaic was at a great height, and constituted an important industry. The difficulties already mentioned, and the restriction which the geometrical shapes of the pieces imposed upon the general design, have given rise to the manufacture in modern times of incrustated mosaics. In this, as in its sister industry, natural clays are used, preference being given to those with a large quantity of alumina, on account of the great heat of the ovens heated by hard coal. The colors are produced by various metallic oxides mixed in proper proportions. In the manufacture of simple mosaics the several moulded pieces are obtained by means of pressure stamps, the matrices of which have the geometrical shapes to be given to the pieces. The baking is done inside boxes or cases of fire clay, in ovens of only one laboratory and one or more fireplaces. In the manufacture of incrustated mosaics all kinds of designs are obtained with the same clays used in simple mosaics, the difference consisting in the moulding, which, as in the previous case, is performed by pressure, but with larger machines, the dimensions of the pieces being larger. The shape is always square, with sides of 2½ inches or more. The designs are obtained by placing slips of tin within the stamp matrices, and each one of the intermediate spaces formed being filled with the different clays previously colored. The designs thus obtained, the slips of tin are removed, and the whole rendered compact by pressure.

MINERAL PRODUCTS.

The following table is compiled from the sixth report of the Mineral Resources of the United States, by David T. Day, chief of Mining Statistics, etc. It relates to the products of 1888.

Pig Iron.....	6,489,738	tons	Value	$107,000,000
Gold............	1,604,927	oz.	"	33,175,000
Silver..........	45,787,632	"	Coin value	59,195,000
Copper........	115,635	tons	Value	33,833,954
Lead	180,555	"	"	10.680,000
Zinc......	55,903	"	"	4,782,300
Quicksilver.	132,118	"	"	1,413,125
Nickel	195,182	lbs.	"	115,518
Aluminum.	3,000	"	"	13,500
Al. Bronze..	18,000	"	Value not given	
Petroleum...	27,346,018	bbls	Value	$ 24,598,559
Coal............	142,037,735	tons	"	$204,221,990
Salt.............	8,055,881	bbls	"	4,337,204

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN BY CORRESPONDENT. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Coal and Its Value as a Fuel in Brick Burning.

Editor Clay Worker:

What has been said in a subsequent article in regard to the difference in value of wood is applicable also to coal.

The coal measures are distributed over a large area of the inhabited part of the earth's surface. And any part that is inhabited by civilized peoples, in the alluvial districts which is void of coal is still largely dependent upon coal for some of its uses, in the arts and manufactures.

It is found upon analysis, and more clearly by practical tests, that coal varies very much in its constituents, and as a heat producer.

The coals, classed in market as Muskingum Valley coal, Brier Hill coal or Pittsburgh coal, has no uniformity of grade; and varies from good to bad in different mines, of the several districts. And so it is through all the different coal measures of the different states and sections.

Geologists teach us, that the brown coals or lignite, are examples of imperfect coal or what is termed coal of recent formation.

This is loose in texture, soft, dirty and produces a low heat with a large proportion of ash and refuse.

The bituminous coal fields of most sections, have some mines that approach this quality of coal; particularly where the coal lies near the surface, or crops out on hillsides, or in ravines or bottoms of streams; that which lies deeper in the earth being more pure or perfect coal.

In this grade of pure or perfect coal the combustible matter is part fixed and part volatile.

When the combustible matter contains from 90 to 95 per cent. fixed carbon, it is called anthracite coal.

If it contains from 80 to 85 per cent. fixed carbon and 15 to 20 per cent. volatile matter, it is called semi-anthracite, or semi-bituminous coal, of various grades.

If the volatile matter rises to the proportion of 30 or 40 per cent. it becomes full bituminous coal, which always burns with a strong clear flame, and will cake over, or melt together into a mass: and when the flame has passed off will burn as coke with an intense white heat, melting the solid ash into a cinder or clinker.

If the coal approaches, or exceeds 50 per cent. of volatile matter, it is highly bituminous fat, or fusing coal, and is well adapted to the manufacture of coke, gas, oil, etc.

Now after careful comparison of different coals, it is evident there must be a great difference in results, in brick burning in using the different varieties of coal.

I am frequently asked: "How much coal does it take to burn a thousand brick by your method?" Now that is a question that I will answer, and do it as near correct, as the man who will tell me how much milk a cow gives, or how much does a lump of chalk weigh?

I have frequently been interviewed by men who are interested in railroads as master mechanics, roadmasters, engineers (C. E.), etc., and they also had a smattering knowledge of, and controlling interest in a brick yard.

These men had their locomotives to do a stated amount of work in a certain length of time, with a regular allowance of coal. All, figured out and tabulated, by rules and problems in engineering and physics. And they did not hesitate to tell, that a man who could not tell how much coal it took to burn a thousand brick was not fully up to the head in his class as a brick burner.

This article is to answer that class of brickmakers. When an engineer is confined strictly to one grade of fuel, each engineer his own engine, and one route of travel regularly and his load never exceeds a certain number of loaded cars, he can then tell very nearly how much coal will be needed to make the trip.

But with the poor brick burner the case is an entirely different one. He has no means of knowing how much moisture has to be expelled from his green brick before they are burned.

Sometimes his fuel is from one mine which is a free burning fat coal and again it is from another mine which is dirty, full of slate and sulphur, and altogether is a poor fuel.

At one time his fuel is all slack or coal refuse, and another time it is all nut coal of fair quality, or during a scarcity of this grade he has run of mine.

In my own case, I have had the best coal to raise heat immediately after the watersmoke was off, and then be compelled to use a poor quality of coal dust, with a settling heat and finish. Our engineer will say: "Why do you have it so?"—"Why don't you use a uniform quality of coal?" Well, I answer that I have found, that railroads, and brick yards, are of a necessity compelled to run business in two entirely different channels. The financial standing of the two is so wide apart, they can't be run together on the same rules and principles.

And again it is a conceded fact that clays vary in their refractory properties. So that the man who burns fire brick will use 1¼ tons of coal to the thousand; while on the yard next to him, where common red brick are burned, the same amount of coal will burn four or five thousand brick. And all brickmakers of experience who are up to their business know that their clay will vary in the bank and in many cases must be mined, mixed piled, and mixed again in proportional amounts from different parts of the pit to secure a uniform grade of burned brick. This argument is to show that there is no exact rule, and can be none, for pounds of coal or wood to the thousand of burned brick.

And there are also various other reasons that can be assigned which will always remain among the undemonstrable problems of brick burning.

Block coal as it is mined comes to market in large lumps partaking the nature or appearance of slate, that can be split into slabs or sections, and is not liable to fall to pieces in handling, while it is a free burning fuel it leaves a large quantity of loose light-colored ashes; and on account of its large size and hardness in breaking, it is not desirable as a fuel for brick burning.

Coal that is used for burning brick should be of a small size so as to scatter evenly over the grate bars and begin to make heat rapidly.

Block or lump coal can be used in its coarse condition as mined, in blast furnace work; but for brick burning, the best success is attained with nut coal and coarse grades of slack or coal screenings.

The experience of the writer is that the very best coal to produce heat, with freedom from excessive clinker, a low per cent. of sulphur, or slate, is that from the mines of East Tennessee.

While there are other sections that produce a good quality of bituminous coal, that may be equally as good or even better, our observation among the coals of Northern Ohio, Western Pennsylvania, Indiana, Illinois, Missouri, Virginia, Alabama, Georgia and Tennessee, goes to prove, that all things considered we give it precedence over the others.

The Virginia coal mined on the line

of the Norfolk & Western Railroad and classed as Pocahontas coal, is a bright, glassy, bituminous coal; or as some call it, semi-bituminous. This coal is of a free burning nature, but is not productive of much flame, rather too much sulphur, and makes a large amount of heavy clinkers. The lumps of coal are readily shivered or knocked to pieces with a light blow of a hammer.

The one great fault of a coal of this kind is, it breaks up too fine; and when "fired" the fuel lies so close on the grate bars as to virtually close all draft through them. This is one cause of its liability to clinker; the heat goes over the top of the mass, or for lack of draft, is held in the furnace causing a melting together of half burned coals, which cool on the dark ashes below.

This coal is so fine and free in parting into dust, that when shoveled into a superheated furnace, the particles will ignite with a flash like powder; and cause a rebound of the flame at each shovelfull three or four feet outside of the furnace door.

While it is not the intention to write up the coal of any locality, or deprecate another, but merely to compare the value of the different kinds of coal, and show that manufacturers of brick and clay wares, have a different problem before them than the man who uses coal to raise steam in his boiler, or to make heat for domestic use or any other of the uses to which coal is applied. Take for instance, the anthracite coal of Pennsylvania, and for cleanliness, evenness in burning, lasting qualities, freedom from sulphur or any other deleterious substance, and for domestic use, it can scarcely be excelled as a fuel; certainly not for cheapness and unlimited quantity. But we must question its use as a fuel in brick burning; for the reason that it has but little flame and is virtually slower of draft, consuming more time to burn. Again it is of a smooth or slick nature, which is enhanced when brought to a red heat, and has no coherence one particle to another; which allows it to part with all of its fine coal, by slipping through very fine grate bars into the ash pit, thereby causing waste; while bituminous coal will part with its tar or oily components and cause it to expand and cake over the grate bars. And can then be rustled up with the firing iron, while the flame carries the heat high up in the kiln, and cause hard brick to be burned at the top or near the platting courses. In burning brick with coal it is always best to drive off all the moisture first with wood or coke, before putting on the coal fire; there being a tendency in most kinds of bituminous coal to produce a large amount of heavy smoke and soot, that clings to the damp brick at the top part of the kiln, and retards the draft, or as the brick burners say, "chokes the kiln," and can only be driven off by long continued firing with coal, or what is quicker and a better plan in such a case, is to stop firing with coal and fire with wood until the red heat is well up in the kiln and shows all over the top.

Coal has the reputation of burning the brick a darker color than wood fires; this may be true. But my belief is that coal furnishes a steadier heat, and where coal is used, there is a better provision for brick burning, control of fires, less of cold air admitted among the heated burning bricks; and as a result the bricks are more uniform in color, are not blued or shaded by cold air drafts, and have their true color. This is more marked in the improved kilns of modern design than in the old style clamp walls.

An opinion prevails among a great many brickmakers that coal cannot be used for burning brick without grate bars and furnaces, and they go on from year to year using wood alone at a high price in the sections where coal is abundant and cheap. We will give our observation and experience in the matter which can easily be verified.

When you desire to burn brick in part with coal, you begin first by setting your arches twelve inches wide, three-and-a-third brick bench, set nine courses high, with four overhanging courses. This makes the arch high enough to build two fire holes to each arch at each end of the arch.

First, build the lower one outside three bricks in length, four courses high, and arch them over, on top of these arches or fire holes lay any heavy iron bar. An old railroad iron is about as easily procured and suitable as can be had, laid next to the kiln, and crossing all the arches. This bar serves as a bearing for cord wood to lean on when firing.

Now level up on top of the arches and fill in carefully between all the buttresses, and then another arch immediately over the one below, and of the same size.

In watersmoking the kiln, fire altogether in the lower arches, next to heads, and as the kiln gets dry and hot, fire in the upper arches, with wood only. Then when you have draft enough in the kiln to burn freely, slide in two sticks of wood in each arch letting the ends rest on the iron bar, on top of this wood shovel in coal until the upper arch is closed and the draft through the lower arch will cause the coal to burn free.

The lower fire hole or arch must be kept clear and bright clinkers pulled out, and all draft through a bed of free burning coals.

At each recurring fire, shove in the coal in upper arch with the two sticks of wood, then fire coal on top of them as before.

When it is necessary the arches can be fired by sliding wood to the center as in any old style kiln.

In this way a good heat can be produced and the fuel bill very much shortened. Lump coal or run of mine is the kind to use, as coal that is fine requires grate bars.

While there is some advantage in this method over wood alone, where coal is plenty and cheap, we do not desire to be understood as especially recommending it. Our preference is unmistakably for permanent kiln walls and furnaces.

Where kilns are properly constructed and managed, and three arches are burned with one fire, there is a great saving in labor, fuel, and wastage of brick; permanent kilns are plenty enough at this day so there is no controverting the fact. And they are designed to burn wood, coal, gas, or oil, according to your locality.

BRIX.

Burning Dry Press Brick.

Editor Clay-Worker:

You ask for a letter on dry press burning. Well, from my experience, I would rather undertake to get a really good kiln of brick made by the dry press process than in any other way. The watersmoking must be done much slower, in fact one ought not to be able to see the smoke coming off the kiln. Never have more than seven small sticks of wood in each fire hole and those burning slowly. The fire ought not to be kept up continuously the first five or six days and if the bricks are very damp when they go to the kiln I would advise one to burn 12 hours then close up kiln 12 hours alternately, say, seven or eight days. Then get heat up (after watersmoke is all gone) very slowly. After that a man who can burn a good kiln of any other kind can burn dry press brick. The last kiln I burned was a common case kiln and I venture it was as good an average as nine out of ten of the new patent kilns.

Another method of burning which I think will be of great advantage in places where wood is getting scarcé, is by using screened bituminous coal, making small flues at the bottom of the kiln in which is placed wood and bituminous coal. This is merely to set the other coal on fire. Then lay the brick together and put a layer of small dust coal between each layer of brick. Then set the kiln as large as you like or as small, I have burned 10,000 in one and as many as 1,000,000 in the other. The amount of fuel, is small and the breakage in burning is small, you get a better and more even burn without the trouble of burning after setting fire to your bottom flues. That ends the matter except if the wind blows hard you must put up some shelter. However, this manner of burning will only do for mud or slip brick. Sometimes there is a clay that, if made by wire cut machines, will stand the fire. The brick have to be very dry before setting. THOMAS PARKER.

New York News.

Editor Clay-Workor:

It would take almost a full page of the Clay-Worker to go into details regarding the fluctuation in the brick market here since my last writing. There has been an enormous demand almost the entire time, and building has been quite lively. At the beginning of June prices were very low owing to the fast production. At the time of the Centennial there was the worst glut that the market had seen since last year and prices were very low. When that was worked off, shipments were modulated by the manufacturers and prices advanced almost 75 cents on all hard grades.

The brickmakers began to chip on the advance at once, and boat load after boat load went down the river. As the fourth of July approached, buyers, anticipating a short supply immediately thereafter, bought largely in excess of their immediate wants. The supply, however, continued full, and this caused another small glut and a decline in value of 25 cents. At the present writing the accumulation has been worked off, and there is every prospect of the old business being re-established—the supply being regulated to the demand. The rainy weather has interfered very materially with the output of brick and it is probable that a very large shortage will be the result.

The craze for erecting monster office buildings in this city has not abated, but in the composition of most of those going up brick only enters for the inside walls; the exterior as a rule being of limestone granite, brown stone and other materials. The new building at the corner of 14th Street and Union Square now being erected, is to be nine stories high. The first four will be of Indiana limestone, the three above of brick and the two top stories of terra cotta. The cost will be $250,000. On the corner of Broadway and 32nd Street a nine story hotel is is going up the front of which will be of marble, buff brick and light terra cotta. This will cost $500,000. The Children's Aid Society has filed plans for the erection of a four story brick and stone school house in 73rd Street near 1st Avenue to cost $64,000. These few items only give a glimpse of the work that is going on. The daily papers fairly teem with reports of flats, office and club buildings, churches, synagogues and schools that are going up on every side, and the prospects are that this will be a decidedly lively summer and autumn for builders.

On the 5th of July the books of the Building Department were closed for the first six months of the year. The figures showed that up to the present time this has been one of the most prosperous years that builders in the metropolis have ever had. Although the number of buildings going up on the West Side of the city is not as large as during the great boom in real estate in 1887, the value of the building is equal in every way. In 1887 dwelling houses were erected, this year it is office buildings, business houses and expensive flats, almost all of which are below 59th Street. The boom two years ago was far above that locality.

A riot broke out on June 23d between the Hungarians and negroes employed in James A. De Groots' brick yard at Albertson's Cut, a little hamlet on the Hudson, in which two of the Hungarians were killed and ten others seriously injured. The assailants of the dead men have been held to await the action of the Grand Jury. BRIC-A-BRAC.

An Observation.

Editor Clay-Worker:

While here I noticed a Dryer in the yards of the Yankton (Dak.) Pressed Brick Co., which seems to contain several features to commend it to brickmakers making from 20,000 to 25,000 brick per day. This Dryer consists of two wide tunnels 14 feet wide inside and 80 feet long. The heating apparatus is arranged on the Iron Clad System with the vapor stack at the opposite end. The new feature in this Dryer is that no rails or cars are used. A portable hake or truck is used for carrying the pallets through the Dryer. The system is very simple and inexpensive and seems to work admirably. Parties interested in brick dryers should go and see this in operation, as the cost is about half that of brick dryers as ordinarily constructed.

The Economy Portable Brick Hake in use on this yard and which is manufactured by the Yankton Pressed Brick Co., is an admirable device for handling soft or stiff clay brick. A PILGRIM.

The Village Brickyard.

Editor Clay-Worker:

Some notes on enamelling brick (continued):

In July Clay-Worker an outline was given of some experiments as to the possibility of introducing fancy glaze work into the Village-yard by way of the old-fashioned open top kiln.

The following samples were set 14 bricks from the bottom and are estimated to have received 2200 degrees of heat being subjected to more than usual on account of a flue or split in the kiln. Each ingredient was mixed to a thick paste with water, being ground fine in a porcelain mortar and then applied by a brush to the brick surface.

Feldspar.—Partially fused fast to the surface—slight gloss—balance of the material like whitewash and will rub off.

Kaolin.—Dried only and coat can be entirely removed by washing in water.

Boracic Acid.—Fused into surface giving slight gloss and changing color to steel red.

Bone Ash.—Whitewashed and removable by washing.

Oxide of Zinc.—Fused into surface, giving no gloss but changing color to buff yellow.

Oxide of Manganese.—Fused into surface, giving blue black steel gloss.

Red Lead.—Fused into surface, giving brownish black lustre.

Carbonate Lead.—Fused on surface, giving grayish black gloss of very desirable color.

Carbonate Soda.—Absorbed in the brick with slightly darker addition to the surface color.

Gray Oxide Tin. }
White Oxide Tin. } Whitewashed and readily removable by washing in water.

These are among the most prominent materials available and various combinations may be arranged that will show good results in our kilns. For instance:

Glaze No. 12—Carbonate lead 33 parts, feldspar 11 parts and flint 6 parts will produce a smooth gloss if set about the middle of the kiln—of a rich, creamy-brown color; it being essential to success that the various conditions of failure named in a previous article, be carefully guarded against—also,

Glaze No. 2—Feldspar 8, flint 7, carbonate lead 7, oxide zinc 5, boracic acid 5, kaolin 2, thoroughly and finely ground and fired in the hottest part of the kiln will produce a satisfactory white enamel. A number of others might be named but as most of them require to be burned and then reground to reach good results perhaps the above are illustrations sufficient.

While the knowledge gained by looking into this subject has been of great pleasure to the writer, the conclusions has never-the-less been fairly arrived at; that it would be unprofitable to attempt to enamel brick on a commercial scale in the way herewith suggested. The interference with regular brick work by using the best part of the kiln for such a purpose and the long time necessary to accumulate stock often wanted at a short notice are subjects that must be considered in this connection.

VILLAGE BRICKMAKER

Notes From Beyond the Rockies.

Editor Clay-Worker:

In regard to the clay working interests of the Pacific coast we will say that everything in that line here is completely overdone. According to the demand either in common brick, pressed brick or fire brick, as well as in sewer and water pipe, and in fact anything in the clay line except terra cotta lumber, which is not manufactured on this coast at present. Sawdust being scarce cut straw would have to be used. There is any quantity of clays for such a purpose, but fuel is scarce and high, and the main drawback.

There are now three vitrified clay sewer and water pipe works in Southern California and three large and one small works in Northern California and business enough for only about one-half as many factories. In boom times there would have been business for all, but there were only one-half as many factories and they located in the northern part of the state, made pipe very high in this part, therefore factories sprung up and the business was at once overdone. The boom bubble burst and the great demand for water pipe stopped and now there are more factories than business.

I hardly think at present writing that any clay working establishment in this part of the state is any more than paying expenses, if that; but the time is not far distant when we hope for much more business. The demand for building material is small at present and will be for some time to come. Fuel in Southern California is the main drawback and costs five times as much as in most Eastern States, especially the Middle States.

C. B. H.

South Riverside, Cal.

What's The Trouble.

Editor Clay-Worker:

I read the Clay-Worker with much pleasure and profit and now come for information. We are making brick by the semi-dry process from shale the analysis of which appeared in the June '89 Clay-Worker, page 394. The bricks burn a very good red inside but the outside is covered with a gray whitish skim, very thin, but spoils the appearance of the brick and prohibits their use for facing purposes. In every other respect the brick are very good. What is the cause of our trouble? If any of your readers can tell us and suggest a remedy we will be very grateful. We want a red face brick bad in this immediate district end if we can get rid of this skim we will have it.

R. S. BLUCK.

Petersborough, England.

NOTES BY J. W. CRARY, SR., ON WRITERS IN THE CLAY-WORKER.

Prof. R. T. Brown has, in the April No. a very intelligent and able document on the peculiar properties of clay, but like all scientists, philosophers and reasoners, the Professor begins at the second cause. No amount of recondite disquisition can ever unveil the first cause. To say that clay is decomposed feldspar and then, that feldspar is crystallized silicate of alumina, is mere abstraction, but it is, nevertheless, an intelligent way to put it and gives us the same as to say, diamond is crystallized carbon and that crystallized carbon decomposed by fire is diamond dust; that bread is decomposed gluten or starch and that gluten is uncooked bred. We can give names to things as they form and transform, but the mystery of their changes remain the same, perfectly unsolvable and inscrutable problems in the millions of the mysteries of God.

Prof. Brown says: "When feldspar loses its crystalline form by exposure to atmospheric agencies, it appropriates two equivalents of water which gives it the form of an hydrated compound. On the presence of this water of hydration depends the plastic property of clay which gives it its chief value. Chemists have doubted whether this water was chemically united with the compound or merely held by the powerful absorbent property of the alumina." Then the Professor most conclusively answers the query by saying, "But if this was the nature of its union, it would be liberated in the form of steam at a temperature above the boiling point." Then he adds the profound, unfathomable mystery, "but it requires a temperature above a red heat to liberate it and when once driven off can never be restored." I have dug clay from decomposing feldspar until the solid rock was reached and although the crystallized clay looked as dry as any brick; the decomposed part though not exposed to water was quite damp and plastic. I could no more understand this than I could see just how God made Adam, but I came to the conclusion that it was water and "dust of the ground" mysteriously, or chemically if you please, combined. The hydration of alumina is its "breath of life," the anhydration is its death.

The Professor well says: "The complete removal of this water of hydration is the condition upon which the durability of all clay work depends." Then he makes a mistake (I don't blame him, for as I have shown in one of my former articles how I made the same mistake) by saying "the loss of this water is the measure of shrinkage observed in the setling of a kiln when it is sufficiently burned. An expert burner measures the completeness and uniformity of his burn by the extent and eveness of this sinking though he may not know why the surface sinks at all.' Here the Professor verifies the old adage "practice makes perfect." Scientists know the road just as far as they have traveled, not one inch further. The great part of all primitive clay, silicate of alumina, such as comes from the decomposition of crystalline substances, is infusible and will become anhydrous by intense heat and will not shrink a particle, and where the silica is in great excess of the alumina in combination and no flux is present, it will swell a little when very hard burned. Such are our clays generally on our southern seacoasts, or anywhere else where there is absence of flux or anything to vitrify or fuse alumina.

Prof. Brown is one of your best and most able contributors.

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T. A. RANDALL & CO.,
14 & 16 S. Tenn. St., Indianapolis, Ind.

PRO AND CON.

It is quite well understood among journalists that the publication of correspondence or papers upon any subject in our line does not necessarily involve our endorsement of them. The views of the writers may be antagonistic to those held by us on the same subject, yet we give them place in order that our readers may investigate subjects that may be of interest from different standpoints.

Indeed it frequently happens that the views of some contributor may, in our judgment, be fallacious, and at the same time serve a good purpose in drawing out of others a better solution of the question than has hitherto been presented to the thinking public.

It is said of Abraham Lincoln, that he invited in every way possible the consideration of important questions from opposite standpoints, so as to arrive at the right conclusion himself.

If one of our contributors should claim that a certain machine makes the best paving brick, we understand him to say so from his standpoint, and our readers should so understand it. He may be wrong, and if wrong, some one will know it, and if it is understood that our columns are open to a free lance, they will say so, and tell us why they think so. And this free discussion will lead to a better understanding of any and all subjects.

A correspondent may be wide of the mark in his statements and views, and in some instances misleading, yet the importance of the subject in our judgment may lead us to give space to its consideration in order that others may feel called upon to refute them and in so doing help others to form correct opinions.

It may be said that our correspondent "A" is not fully informed on the subject which he attempts to treat—that may be, if so, some of our readers will find him out, and let the craft know it. Or it may be said of another, he lacks experience; very well, turn on the light and show him up, he will likely thank you for it.

We want it distinctly understood that our columns are open to the free and full discussion of all questions pertaining to the craft. Two things we ask—the first is, that you must not hold us responsible for the views of others, and secondly, that the interests of all must be respected. And we promise on our part to see that some other fellow turns the grindstone when axes are to be ground free of charge.

PAVING BRICK.

At this time there is much interest manifested in the use of brick for paving streets. It is a move in the right direction, and the merits of paving brick should be fully investigated. We believe that they will stand the most crucial tests provided good pavers are used. To use only the best is the important point in the introduction of this method of improving streets. If the material is good the results will be highly satisfactory, if the material is poor the use of brick for this purpose will be looked upon unfavorably where the poor material is used.

It is not our purpose in this brief notice to say what kinds of clay or what method or methods of manufacture is necessary to produce the best paving brick, but rather to caution against the use of imperfect material. The interests of those that manufacture or who may in the future engage in the manufacture of street pavers, will be best served by the use of only the best brick for this purpose.

A little enterprise is also needful to further the introduction of brick pavements. Let those who can make a conditional contract with their town or city authorities to lay a square or more of brick pavement on a prominent street, arranging with the city to pay for the same after a given length of time provided it proves satisfactory to the traveling public and those who are intrusted with the responsibility of such improvement. Then do the work well, use only the best material, and the work of introducing brick for paving streets will be well on the way.

When only the best material is used and the character of the work done is good there is not a better material for paving streets at the same cost known than paving brick.

USE OF PRESSED BRICK.

There is a brick house in process of construction on B— street. The owner has been at the expense of providing a substantial foundation, and the building when complete will cost $6,000; and would be a much more imposing structure if the use of pressed brick in the front walls had been required. As it is, the front has a rough uneven appearance. The passers-by having taste in such matters are led to exclaim, "Why didn't they use pressed brick? The difference in the cost would be only a few dollars and the appearance would be greatly improved."

Such mistakes will occur but their recurrence will be lessened. We would hardly think of erecting a brick edifice of any cost worth naming without providing for the use of plain pressed and ornamental pressed brick, to be in accord with our own and the educated taste of others. In addition great care should be taken to have the color of outside walls uniform. The day for rugged, streaked and striped walls is past, and we hope that few edifices erected for homes will in the future neglect the use of ornamental brick and terra cotta.

KEEP TO THE FRONT.

There is a progressive spirit among the leading manufacturers of clay goods—better goods—at less cost—more artistic designs—an increased demand for harmony of colors, etc. Some who have not kept step to the music of modern progress and are still in the old grooves may think that others are running after strange gods. But there is a demand for the better goods and the demand is increasing and will continue to increase, and those who keep to the front will see to it that so far as they can, every want in this direction shall be gratified. The truth is, that there are, in the lead, a number of enterprising business men who anticipate these wants in advance, aye, more—create the want by furnishing goods so beautiful in design and so admirably adapted to the use intended that they meet with ready sale on sight.

The old and rough methods, and utter disregard of cultivated taste will not win. Such manufacturers go to the rear. To succeed, we must keep to the front, and get there on time.

THINGS COMMENDABLE AND OTHERWISE.

We have it in mind to say a few things in a very plain way that may apply in part to those who are in the field as manufacturers of clay working machinery, or who have valuable devices otherwise intended to be introduced and used by the clay working industries. We refer to the various methods of doing business, even among those who take the lead in business enterprises.

There are those who are painstaking in the manufacture of their goods, advertise them in the trade papers devoted to their interest, carefully attend to their correspondence, have but one price for time sales and one for cash, fill their orders promptly and vigilantly strive to make good every promise, without caveling about it.

But the business man who stops at this, neglects an important feature that is needful to secure the most gratifying success, and that is the little business courtesies that should sweeten the business life—thanks for "your favor," "your order," "your prompt payment," for "your good word," etc. Then follow up the goods sold with inquiries about their use, and if there are little difficulties, make timely suggestions to overcome them. In this way it is not only possible to build up a large trade with good goods but in addition, make a host of friends—friends that will commend both the goods and the maker to others. All of this is commendable—and more, it is profitable.

There are those, who are men of good intentions, have some push in a business way, but are careless in many ways—careless in correspondence, in filling orders, causing unnecessary delay and expense to their customers and in many ways annoy their trade, though intending well.

Another class depend too largely upon booming their trade upon claims that those patronizing them are not expected to realize, only in exceptional cases, and these cases are paraded before the public, to extend the trade. But there will come to such a trade method a falling off, and a falling out, for such methods will make few friends and many enemies.

Another class make a show of business method. In the beginning, they advertise in the trade journals, push their trade, indeed "boom it" as they say, but their great effort is to get a settlement for the goods sold, and after that the goods and those that bought them are rudely thrust aside, and new fields and new victims are sought for.

To illustrate more particularly: By one way and another they secure the names of parties, send them special offers, and hire the influence of other parties to aid in doing in an underhand way what they cannot do openly. But in all cases they are persistent in securing a settlement in advance of a fair trial of the representations that have been made. The day of reckoning comes to this method of driving a trade—it must and will fail.

Another method of making the trade "go," is to refuse to advertise in trade papers, but rather secure some one or more shrewd agents to drop down in a business centre, stop at the best hotel, inquire for the men of capital, and "work" up in various ways a "business enterprise," as it is called—find some venal man who has a local moneyed reputation, to influence others to organize a huge stock company—talk up the "machine," take a part of the stock, put in the machine at enormous figures, start things going, sell out the stock at a discount and seek new fields and pastures green. They never advertise, oh, no; they don't do a small business. If they did advertise they would soon become known and that would defeat their method of doing business. We could name a number of enterprises that have cost local capitalists a mint of money and much wear of mind—and the throwing out of the "machine" and the putting of the enterprise upon a very different basis to that intended when it was "worked up."

Stock companies and large enterprises are well enough if organized in a legitimate way, but beware of the men who are quietly in the field talking up the "machine"—a sharper "cheek by jowl" with some local sharper "working" up a "business enterprise," and who does not want to be known or have his machine known to the trade except locally where his sweet will has it in mind to confer a lasting advantage to the very few that he is disposed to take into a "great business enterprise," as he denominates it. Such methods are not commendable—in fact are swindles.

The men to be trusted, patronized and commended, are those who are prompt and fair in all their business methods, who advertise in their own trade papers, who are content to put their claims fairly before the trade and then make for themselves a reputation by making good their representations and besides make for themselves a host of friends by observing the little business courtesies that make it pleasant for business men to do business with courteous business men.

THE FUEL QUESTION.

It is currently reported that an English syndicate is visiting the large cities of this country with the view of establishing plants for the manufacture of fuel gas, which it is said, they will be able to furnish to consumers at 25 cents per thousand feet. The fuel question at this time is commanding special attention. The discovery of natural gas in such quantities as to indicate an almost inexhaustible supply in the future, has encouraged many manufacturing interests to locate in what is known as the natural gas area. With fuel practically free, they are able to compete with rival interests in other localities in the reduction of the price of their products so as to threaten the future of what has been heretofore, prosperous manufacturing establishments. As long as all were practically upon the same footing in the cost of production the trade was in no danger. The fuel consumed was one of the important items in the bill of expense. To have all necessary fuel free is a saving in many lines of manufacture sufficient to enable the manufacturer to realize a satisfactory profit if the goods should be sold at their actual cost of manufacture by other establishments where the common fuels are used, such as wood and coal.

Many large interests cannot be removed, but they must compete with those who have the advantages of natural gas, hence they must have a cheaper fuel. The use of crude oil is being introduced successfully. With oil, brick manufacturers have been able to burn brick at a cost of 40 cents per thousand and the end in the reduction of cost is not yet. Now comes those who propose to furnish fuel gas manufactured from coal at a cost of 25 cents per thousand feet. It is claimed that it is a saving in the consumption of coal of more than 70 per cent. to those who may own their own fuel. The present consumption of coal with the common methods of combustion involves a a great loss of heat. This is apparent to all who have had any experience in this direction. In the use of fuel gas the heat is utilized to an extent that practically reduces the waste to a minimum.

However, the manufacture of fuel gas is being conducted successfully by several large manufacturing interests under patents granted in this country. The inventive genius of the age, especially in this country, is so fully on the alert that we never know when the end of further improvement in any device has come. Possibly within twelve months, further discoveries will by far excel those in use. This is true of machinery. An inventor may patent a device which he judges to be perfect and demand for its use a large sum and refuse to accept a handsome compensation for his labor, mentally and otherwise, believing that he can and will control it and command his own price for it. In his fancied security he awakes some morning to find that another has patented a device for doing what his did and more by a different and more simple process. So we confidently predict that the end is not not yet in the reduction of the cost of fuel.

There are tile and brick interests, many of them, perhaps, that would find it a great saving to put in a plant for the manufacture of fuel gas and they will at no distant day. The time has come in the history of manufacturing interests when they cannot afford to ignore these important economic questions.

ANGLING AND ADVERTISING.

Advertising has some features resembling others in fishing. In the latter occupation no definite rules can be given, as the circumstances under which fish are caught are as varied as the tales which find willing ears upon marines. But one instance is recorded of fishing by rule, in the case of a learned professor, who was persuaded one time to leave his books and his manuscript to show up his character as an angler. He had been carefully instructed as to bait, and how to drop his line in the water, and to watch the bob. Of a sudden the bob disappeared like a shot, and the professor, turning to his instructor, said: "Do not let me interrupt you, my dear boy, but in case the bob disappears, what do you suggest as the next feasible movement on my part?"

If, however, there be left out of consideration the matters of preparation, attention, patience, all of which are equally required in any calling or occupation, there is one prime qualification for a successful angler, whether he be a fisherman or a fisher of men, and that is, "knack." Here are two anglers, side by side; one is supplied with richly wrought bamboo pole, silver reel, silken line, fly-hook of most improved pattern; his sporting suit is English, you understand, and his tourist helmet gives him quite an air *distingue*, and withal he fishes with the air of an expert; but the fish don't bite. Following him is a lad, shock-headed, straw hat, crown gone, with just enough clothes on to "wad" a gun, and handling a pole cut from a bush in the woods. His fish line has many colors and more knots, his hook is not the sharpest, but watch him. The bob is floating quietly on the surface of the water, and balancing himself at the end of a bough overhanging the stream, he is almost dozing. A commotion of the water around the bob drives away that drowsiness instanter; slowly he raises his pole until his line is nearly taut, and then with the disappearance of the bob, he pulls slowly, and more and more rapidly, until he lands his game, and sizes up the modern sportsman with a leer, as he re-baits, spits on it, and takes his stand for more game.

Now the features wherein advertising has parallelisms with angling are all embraced in the word "knack." The advertiser, in the first place, must know there is business where he goes, just as the angler knows there is fish where he throws his line. And very often this has to be tried. Then it is necessary to know what is the best inducement to attract the prospective customer, and not only to attract, but to persuade him to buy. Just as the angler must know the best bait, and how to serve it. And then there must be experience; that is, one has to learn the knack.

Experience has taught that practice makes proficient in anything and everything. It's so in angling, so in advertising. That jolly fisherman—he hasn't been long at it—you can tell that—with his feet spread out, his arms grasping his fish pole, and body erect, he is watching the red and white painted cork as it bobs up and down; now the bob disappears, and with a jerk that ought to have straightened out the most crookedly barbed hook, he lands his line in the branches of the nearest tree, not only without a fish, but his bait gone, and travels elsewhere.

So there are advertisers who are continuously moving about. They have not learned the knack of placing their advertisement in an effective manner. The requisites which are generally observed are to know the goods, who will want them, and the quickest and most economic way of reaching their buyers. Having become satisfied as to these points, the extent of the "ad" is determined, and that is wholly a matter of judgment and experience.

There's a difference between scooping for minnows and harpooning for whales; in snipe shooting and "loading for b'ar;" but it often happens that in advertising a small card will do the work of a full page. This is, however, the exception, not the rule. A study of the subject will show that the longer an advertiser is seen, the larger is his card.—*Ex.*

WHITE ON BRICKS.

The white spots which so often appear on brick work are a frequent subject of inquiry as to their cause and remedy. Samuel Cabot, of 70 Kilby street, Boston, writes on this subject as follows:

The cause of this has been recently investigated by the writer with the following results: There are at least three different substances which cause this. Of these, carbonate of soda is most common upon new work, after the lime stains have been removed. This is due to the action of the lime mortar upon the silicate of soda in the bricks. Silicate of soda seldom occurs in bricks unless the clay used is a salt clay.

The only other white efflorescence in importance is chiefly composed of sulphate of magnesia. This is due to pyrites in the clay which, when burned, gives rise to sulphuric acid, and the latter unites with the magnesia in the lime mortar.

The above are the results of actual examinations by the writer. The conclusions thus far arrived at are these:

1. The "efflorescence" is never due to the bricks alone, and seldom to the lime alone.

2. To avoid it the bricks should be covered with an oily preservative capable of keeping the salts from exuding. Linseed oil cannot fill the requirements as it is injured by the mortar.

The writer wishes to investigate the matter still further, and will be obliged to any architects who will send him samples of this substance (say a quarter ounce) that may come under their observation.

The writer will make a careful examination and report free of charge, and will publish any results which he deems valuable to the profession.—*Builder and Woodworker.*

PRESSING BRICK.

BY MARGARET ANDREWS OLDHAM.

Perplexed with business cares and rushed for time the other day,
I paused to see the subject of a joke that passed my way.
In answer to a well meant question, "What's to pay with Dick?"
Came this mysterious reply: "You know he's pressing brick."

I watched him walking through the town in easy-going style;
He loitered here and lingered there, and passed you with a smile;
He seemed to have no destined end, appeared in no great haste,—
In fact, I thought he tried to see how much time he could waste.

His hands with grace and restfulness, within his pockets lay,
Whose most capacious emptiness gave undisputed sway.
And every crowd he passed or left, the same queer words fell thick;
The same reply I too received, "Oh, he's just pressing brick."

Day after day, week after week, he passed with listless gait.
His clothes now rusty, seedy grown, his manner more sedate,
And yet, whenever I would ask, wherever he might go,
Came ever these strange, obscure words: "He's 'pressing brick,' you know."
Poor fellow! Soon he grew so thin, so thread-bare, pale and gaunt,
I just concluded in my mind the fellow was in want.
And so in tender charity a resolution made,
To find out what the trouble was and freely give him aid.

But fancy my intense chagrin, my disappointment, too,
When he replied with yawning smile, "Oh well, I thought you knew;
My bread fell on the buttered side—such things will sometimes be,
In fact, at present, my dear sir, I'm press-brick, you see!"

The same clear explanation! Well, I let the matter rest;
To find out what the puzzle meant I'd done my level best.
But while the flame of reason burns my life's e'er shortening wick,
I pray to be delivered from the work called "pressing brick!"

RATS.

I have it on good authority, writes a New York correspondent, that John H. McNamara, a son-in-law of Frank Timoney, while in the latter's brick yards at Fishkill, N. Y., recently, saw a large rat run across the place in which were a brood of chickens. The old hen, who evidently imagined her chicks in danger, ran after the animal, attacked and swallowed it before it had expired.

THE RAIN AND BRICKMAKING.

The heavy rainfalls of this season have seriously interfered with the business of brickmaking in many localities. Where the old methods of drying on the ground without other store room except to hake and cover with boards, the loss in some instances has been very considerable. Those that use driers, pallets or cribs for drying can fully appreciate the advantages of such provisions. It is difficult to dry brick in wet weather with the best appliances—the moisture is taken up very slowly by the already saturated air, but when the loss of labor is added it is a much more serious matter. But we predict that many open-yard brickmakers have already determined to provide better things for the following season's business.

THE POTTERY TRUST OFF.

The East Liverpool *Crisis* says the Pottery Trust is finally off, and it is now admitted that the project was a scheme of Trenton potters who are very much disturbed over competition from the Ohio Valley. The potteries are now beginning to prepare for the fall trade, and though the proprietors admit that the business is badly demoralized in Trenton, yet they think the outlook for the trade this fall is very encouraging.

FORMING A BIG BRICK TRUST.

Pierre Lorillard at the Head of a $15,000,000 Industry.

New York, July 21.—Arrangements are in progress for the formation of a gigantic Brick Trust, which will completely throw into the shade the English syndicate's operations regarding the Detroit brick yards. The prime mover in the scheme is Pierre Lorillard, who already has nearly $1,000,000 invested in the Lorillard Brick Company's yards at Keyport, N. J., and a capital of $15,000,000 will be subscribed.

Owing to an enormous overproduction in the brick yards on both banks of the Hudson and along the Jersey coast, the business has ceased to be profitable. Prices have been reduced by competition to such a point that dealers say there is absolutely no money in the business this season.

It was on this account that the New York and New Jersey Brickmakers' Association on Wednesday decided upon a general shut-down of the works on September 1, about two months earlier than usual. Of course, this will throw thousands of men out of work.

The association, it is said, has no power to control prices. Manufacturers who pay a rent of $1.25 a thousand on a capacity of 6,000,000 bricks, could not afford to shut-down after making, say, only 4,000,000 bricks, leaving them $3,500 out of pocket. A few years ago men became wealthy from brickmaking, and emulations of their good fortune caused every capitalist in the neighborhood of a clay bank near the river to embark in the industry. The new trust will buy up the larger concerns and crush out the smaller.

TRADE LITERATURE.

The Kilbourne & Jacobs Mfg. Co., of Columbus, O., are out with a handsome catalogue of their specialties. They manufacture a great variety of Trucks and Barrows of all kinds, also Wheel and Drag Road Scrapers, Contractors R. R. Plows, Dump Carts, Etc. Their Wheel Scraper is especially adapted for moving clay from field to sheds on dry press brick yards, and their list of Barrows embrace almost every known form and style. They solicit correspondence and will be pleased to send a copy of the catalogue to any of our readers.

C. W. Raymond & Co., Dayton, Ohio. have issued a new catalogue of their Brick Yard Supplies, of which, they say, they make a specialty and as they have made a study of the matter they know what is wanted and propose to furnish it as wanted. Send for a copy of their new catalogue and keep it as a book of reference.

Fate & Freese, Plymouth, Ohio, are sending out a new and attractive catalogue of their Clay Working Machinery including the Ohio Brick & Tile Machine, which continues to grow in popular favor. Write for a copy, mentioning the Clay-Worker.

The St. Louis Iron & Machine Works, builders of the Lion Dry Clay Brick Press have received an order from the Hydraulic Press Brick Co., for two ten-mold presses. There is no machine shop in existence that has converted more iron into dry clay brick making machinery than the St. Louis Iron & Machine Works and the excellence of their manufactures is a source of satisfaction to their customers. The aggregate weight of brick presses now in construction at their shops is about 250 tons and the combined pressure of these machines, when at work, will represent near 2,500 tons.

EDITORIAL NOTES and CLIPPINGS.

Winston, N. C., is to have a brick yard.

Elias Day will start a brick yard at Easley, S. C.

J. H. Rogers & Co. will make brick at Union, S. C.

W. G. Barron will start a brick yard at San Augustine, Tex.

McClure & Strange have started a brick yard near Buckner, Ark.

J. W. Bye will make brick near Middlesborough, Ky.

O. M. Sanderson, of Dedham, Mass., will build a brick yard.

Mr. Keasby, of Perth Amboy, will build additional brick works there.

The Star City Brick Co., of Platsmouth, Neb., has been organized.

Adam Green is enlarging his pottery at New Brunswick, N. J.

McClellan & Woolf will start a brick yard at Piedmont, Ala.

A brick yard has been started at Staley, N. C., by Moffett & Co.

The Jackson (Tenn.) Brick Mfg. Co. intend to adopt oil as a fuel.

Alfred Gollien wants to start a tile factory near Blocton, Bibb Co., Ala.

The Climax Fire Brick & Tile Co. are enlarging their works at Texarkana, Ark.

The American Encaustic Tiling Co., of Zanesville, O., is using crude oil as fuel.

Hopkins & Bane have started a brick and tile yard at Short Creek, W. Va.

A large paving brick establishment is to be built at Fort Smith, Ark., by W. A. Doyle.

Wm. Farrell & Co., Wrightsville, Ark., will purchase brick machinery and start a yard.

The Winona (Ill.) Coal Co. intend starting a large dry press brick plant at that place.

A large brick yard is to be started on Fidalgo Island near Weaverling's Pit, Wash.

The Franklin (Pa.) Paving Brick Co., has been chartered by Hon. Chas. Miller and others.

The Jarden Brick Co., of Philadelphia, Pa., has been incorporated with capital stock of $1,000,000.

The Fidalgo Brick & Tile Co., of Anacortes, Wash., has been incorporated. Capital stock $50,000.

R. E. Thomas and W. C. Bradford, of Clarksville, Tenn., will start a brick yard at Cumberland City, Tenn.

The Capital City Vitrified & Paving Co., of Topeka, Kan., has been incorporated. Capital stock $30,000.

Jas. M. Smith and others, of Madison, Wis., have incorporated the River Falls Brick Co. Capital stock $40,000.

The kiln sheds of the River Falls (Wis.) Brick Co. were destroyed recently by fire. Loss $30,000. Insurance $18,000.

R. J. Camp & Bro.'s Works at Campville, Fla., have shut down for the summer with 1,000,000 brick on hand. The demand is very light now and trade is dull generally throughout the state.

The Jackson (Tenn.) Brick Mfg. Co. are building a large dry house and intend to adopt crude oil as a fuel.

Hiram Blaisdell and others have incorporated the Cartersville (Ga.) Brick, Tile & Stone Co. Capital $20,000.

The Wheeling (W. Va.) Brick Co. has been organized and will operate the paving brick works at Rush Run, Ohio.

Mr. Harvey Cribbs has purchased the Jordan brick yard at Tuscaloosa, Ala., and will make fancy brick and pottery.

Christian Fell, of the firm of Fell & Heil, a well known brick manufacturer of Trenton, N. J., died July 14th at the age of 55.

E. L. Clark, of Seattle, Wash., has purchased a Eureka Brick Machine and will make pressed brick for the Seattle market.

The Howard Brick Co., Sheffield, Ala., has been organized, with Samuel Keller as President and J. T. Schley, Sec'y and Treas.

It is claimed that a very fine quality of kaolin has been discovered in Western North Carolina 75 miles from Knoxville, Tenn.

Mr. B. P. Eagan, of Lincoln, Neb., is organizing a company to build an extensive brick and tile factory at Nebraska City, Neb.

John Porter's extensive brick works at New Cumberland, W. Va., were totally destroyed by fire July 29th. Loss $20,000. Insurance $14,000.

Luther Denny, owner of a tile factory near Octagon, Ind., was caught in the belting of an engine recently and mortally injured.

Wise Bros. are testing the clay and if results are satisfactory they will build a brick yard near Yazoo City, Miss., with 50,000 a day capacity.

Wahl Bros., leading brick manufacturers of Chicago, have sold their brick yard to an English syndicate who will erect a distillery on the premises.

The Monticello (Minn.) Brick Co. has been incorporated with capital stock of $50,000, by D. P. Montague, L. B. Behan, E. Gill and others.

The Parsons Mining & Smelting Co., of Parsons, Kan., have developed a valuable mine of clay suitable for making "slip" of superior quality.

Fletcher & Thomas, Indianapolis, Ind., report sales of Quaker Brick Machines and Brickmakers' Supplies, generally, as far better than ever before for June and July, the summer months usually being dull in this line.

M. F. Williams & Co., St. Louis, has equipped the Ontario Terra Cotta & Sewer Pipe Co., of Toronto, with a complete plant including one Eureka Dry Press, forty-inch Pulverizer, Revolving Clay Screen, Automatic Feeder, Elevators, Trucks, Etc.

The Colorado Kaolin & Fire Clay Co., of Pueblo, has organized with $100,000 capital and propose to erect large works for the manufacture of fire brick, sewer pipe and other clay products. They own extensive beds of fire clay and kaolin of excellent quality.

The Somerset (Mass.) Potters' Works Co. are building additions and putting in new machinery to increase their capacity from 500,000 to 3,000,000 fire brick per year. The demand for their fire brick, stove linings, etc., is growing so rapidly that they will abandon the stoneware and pottery trade for the present.

The Jeffrey Mfg. Co., of Columbus, O., manufacturers of Chain Elevating and Conveying Machinery, report that trade has been very active the past month. They have orders for Conveyors and Elevators from various parts of the country, and have just shipped several outfits to Japan and South America.

The Alimo Pottery Co., San Antonio, Texas, has been incorporated; capital stock $15,000; N. Mackey, Pres., M. F. Corbett, Sec'y and Treas. They have already erected a two story building 100 by 30 feet and are now building the kilns. Their works are in the heart of the city, the clay being shipped from Calervras 20 miles distant.

Commencing August 1st, one thousand mile books of the C. H. & D. R. R. regular issue will be accepted for passage to local points on the Vandalia Line between Indianapolis and St. Louis. In addition to this, these books are good locally on Monon Route (all divisions) and locally on O. I. & W. between Indianapolis and Peoria. Rate $20.00. JOHN R. MCCORD, Gen'l Agt., Indianapolis.

The *Cleveland News* is authority for the statement that Major J. Ritner Kemp, well known to many brick manufacturers, was recently married in New York to Miss Lucie Adelaide Evelyn, of that city. His first wife and family still reside at Youngstown, O., and Mrs. Kemp told a *News* representative that she had never received notice of his having secured a divorce, or that proceedings for one had ever been commenced.

The Calorific Brick Co.'s entire plant at Kansas City, Mo., has been purchased by the Hydraulic P. B. Co., of St. Louis, and a new company incorporated under the title of the Kansas City Hydraulic Press Brick Co., with a capital stock of $350,000. Mr. John H. Thalman continues as Superintendent. The works will be enlarged and will make a specialty of fine front, molded and ornamental bricks.

The Frey-Sheckler Co., of Bucyrus, O., have had an unprecedented trade for their Clay Working Machinery this year. We learn that the sales during the eight months since the new Company was organized, have been double those of last year's, and we know from personal observation that they then worked night and day to fill orders. In addition to the large buildings they bought last spring, they have built a new foundry and are putting up a brick erecting shop 35x80 feet with traveling crane the full length, and all the modern appliances to facilitate work. They have bought a number of new additions to their extensive collection of Clay Working Machinery, which an elaborate catalogue now in preparation will describe.

W. S. Collins, who opened an office at 171 Broadway, N. Y., a few months ago as Licensee for the Aerated Fuel Company's System, reports his business as rapidly increasing. Among recent orders which he has taken for placing the System in shops are those of Mr. Fayette R. Plumb, Edge Tools, Frankford, Pa.; Messrs. G. & H. Barnett, Files, Philadelphia; Messrs. Benjamin, Atha & Co., Newark, N. J.; Messrs. Heller & Bros., Files, Newark, N. J.; The Enterprise Mfg. Co., Philadelphia; and the E. P. Gleason Glass Co., Brooklyn, N. Y.

A subscriber at Augusta, Ga., writes that all the yards there have shut down with the exception of Rutherford & Co., they are running Chambers' machine. The other leading yards there are Brown & Stall, who run the Frey-Sheckler machine and make a good, smooth brick; Messrs. Parker Bros., who are putting in Frey-Sheckler machine with crusher and pug mill; the Augusta Brick Co., who run two Sword machines; and W. E. McCoy who is putting in a Frey-Sheckler plant. The building business is quite dull now though indications are good for fall.

Many brick manufacturers have begun to use plain and corrugated iron and steel for their roofing and siding, and find it much better adapted for this purpose than any material they have yet used. The pioneers and leading manufacturers in this line, the Cincinnati Corrugating Co., whose ad. appears on the 105th page of this issue, will be found thoroughly reliable in every respect. They have an enormous list of well pleased customers all over the country, to whom they can refer at any time. All interested will do well to send for catalogues and estimates.

Messrs. Moore & Williams, of Thomasville, Ga., in a recent communication say: "We prize the Clay-Worker and never fail to read it through, as we get more information for the money invested in it, than any other paper we get. We are working a clay that takes all the heat we can give it, burns a variety of colors, and when burnt swells up so that our kilns are four inches higher than when we begin firing. The predominating color of our brick is black. We have recently been to Chicago and have some of our clay there now being tested on a dry press machine, if it does well and there is any demand for black front brick, for trimmings, we hope to fill the bill."

The Boston Fire Brick Co., Fiske, Coleman & Co., managers, whose works are located at South Boston, contemplate the erection of fire-brick works at Martha's Vineyard where they have secured control of large deposits of fire clay of superior quality. The new works will probably be located at Roaring Brook, so called, in the town of Chiliwork, where there is a good water privilege, and where the company has just completed a wharf. With clay deposits within three feet of top of ground and only half a mile from the works, it is expected that good fire brick can be made and delivered by the company's barges in New Bedford, Fall River and Providence at prices lower than ever known before. It is proposed to make this a summer factory only, at first.

The St. Louis Iron & Machine Works, builders of the Lion Dry Clay Brick Press, report a number of orders for dry press moulds, which they received since establishing their special mould department for new work and repairing. No part of a dry press exacts as much care in construction as the mould and it is peculiar (to say the least) how indifferently most manufacturers treat this most important part. A mould properly constructed, should *never break*, but should *slowly* be ground out by the action of the clay while under pressure. The many broken liners sent to the St. Louis Iron & Machine Works clearly show, that mould making does not get the attention it deserves. Such attention, of course, always embraces an additional expense, but the first consideration of the builders of clay machinery should be quality.

S. K. Fletcher, of Fletcher & Thomas, has just returned from an extended trip through the South, visiting on the route several places where they have recently put in complete heavy steam brick machinery. At the Tennessee Brick & Mfg. Co.'s yards, Memphis, Tenn., the Quaker was turning out 40,000 brick per day. This is one of the best equipped yards in the country, notably its system of racks and clay sheds. There are several other fine yards in Memphis, particularly that of the Memphis Mfg. & Brick Co., where Harry McCain is superintendent; for neatness, Mr. Fletcher says, this yard surpasses any he has ever seen. E. N. Weigle, Little Rock, Ark., erected a complete brickmaking outfit in May last, and for a new yard is in splendid shape and the Quaker is turning out the best brick ever made in that vicinity. The Hot Springs Brick & Tile Co., Hot Springs, Ark., has recently opened up a yard right up in the side of the mountain. Fletcher & Thomas put in for this firm in connection with their complete plant one of the Frey-Sheckler Co.'s heavy Brown Crushers, about 10 per cent. of the material used being hard angular stone. They are turning out splendid brick, also using one of the Raymond Perfection Represses with a full line of ornamental dies. Mr. Fletcher speaks of the prospects of the South and Southwest as great.

Prof. John F. Carroll, assistant geologist for the State of Pennsylvania, is quoted as saying that the supply of petroleum was last year, 5,000,000 barrels less than the demand and that the shortage is bound to become more pronounced in consequence of the failing condition of the different oil fields. A few years ago stocks were piling up at the rate of 2,000,000 barrels a month, or almost that, whereas they are now being decreased by something like 1,000,000 barrels a month. There are now, it is true, about 12,000,000 barrels of petroleum in tanks in the Ohio field, but this is because Ohio oil has not been used extensively as an illuminant. But the Ohio field, Prof. Carroll believes, will not prove to be so extensive or productive as many suppose. No field thus far known or likely to ever be known, hereafter, will equal the yield of the Bradford, which has produced 56,000,000 barrels of oil, and at one time yielded as high as 105,000 barrels every twenty-four hours. Its production is now down to 18,000 to 20,000 barrels a day and the pool is being drained to the dregs. Possibly there are some pools of 1,000,000 to to 3,000,000 barrels in some of the old fields, and in new territory not yet opened up, but the prospects that such is the case are growing less every day. Kentucky may become something of an oil producer, though nothing great, for the oil-bearing sands underlie a portion of that state and lap over into Tennessee. Texas has some oil, but the experiments undertaken in that state by Prof. Carroll for others, convinced him that the petroleum does not exist in paying quantities.

AMERICA'S ART POTTERY SHOW.

The interest in the production of fine pottery goods is becoming more widespread and deeper in America as time advances, and it is indicated from intelligence received from various sources throughout the United States, that the coming American Pottery and Porcelain Exhibition, to be held in Philadelphia will receive the greatest attention from all admirers and promoters of American Industrial art.

So conspicuous has become the interest in the event that the following convenient resolution has been adopted in the Pennsylvania House of Representatives:

WHEREAS, The Pennsylvania Museum and School of Industrial Art is devoted to the development of American art industry, both by giving practical instruction therein and by exhibiting from time to time the products of native art talent and thus encouraging the efforts your own skilled artisans to develop the industrial resources of the United States and to compete with the products of skilled labor abroad and

WHEREAS, The said Pennsylvania Museum and School of Industrial Art, with the cordial and earnest co-operation of the United States Potters' Association, and of different firms and individuals throughout this country, are making active preparations to hold at Philadelphia, during the Autumn of 1889, an exhibition of American Art Industry in pottery, porcelain, glassware, stained glass, terra cotta, tiles and mosaic work, including a competition for American workmen; therefore be it

Resolved, By the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, that they hereby most heartily approve of this undertaking of the Pennsylvania Museum and School of Industrial Art, and commend the same to all the people of the United States, and especially to the people of the State of Pennsylvania, as one eminently deserving the strong support and zealous co-operation of every American.

NEW INVENTIONS.

The following is a list of patents appertaining to brick, tile, terra cotta, sewer pipe, pottery, etc., and the machinery used in their manufacture issued since our last number: (A copy of any of them can be obtained by sending 25 cents, the official price, to Chas. E. Brock, Patent Attorney, 925 F St., Washington, D. C.)

406,356. Mold for Pottery—S. Jackson, East Liverpool, Ohio.
407,030. Brick Mold Sanding Machine—A. H. Newton, Cohoes, N. Y.
407,145. Ornamental Brick—J. C. Anderson, Highland Park, Ill.
407,102. Sewer Pipe—J. A. Missud, New Orleans, La.
406,885. Brick Truck — J. P. Craven, Cincinnati, O.
407,348. Driving Head for Sewer Sheathing—N. E. Green, Minneapolis, Minn.

THE WONDERFUL WEST.

A Wonderful Road offering Wonderful Rates to "Go West" and see the Wonderful crops of a Wonderful country.

Read the advertisement of the Santa Fe Route "Harvest Excursions" to be found in this issue of the Journal.

Half Fare rates to all points in Kansas, Colorado, New Mexico, Indian Territory, Oklahoma, Texas, Pan Handle of Texas, Wyoming and Utah.

Tickets will be sold on Tuesdays August 6, 20; September 10, 24 and October 8.

STOP-OVER Privileges within limit of these Excursions will be allowed on the Santa Fe going and returning.

CHOICE OF ROUTES whenever your destination can be reached by more than one of the Santa Fe Lines.

F. T. HENDRY, Passenger Agent,
Room 10 Jackson Place,
Indianapolis, Ind.

FIVE HARVEST EXCURSIONS

VIA

The Chicago, Sante Fe and California Railway to Points in Kansas, Indian Territory (Oklahoma), Colorado, New Mexico, Texas, Nebraska, Utah, Wyoming, Montana and Idaho.

A series of cheap excursions to the western farming country has been arranged to leave Chicago and all other points east of the Missouri River on the following dates: *August 6 and 20, September 10 and 24, and October 8.* These dates all fall on Tuesday.

The rates for these excursions shall be the *lowest first-class fare*, one way, for the round trip. The tickets will be sold at all railroad points beyond, but not on the Missouri River.

The limit shall be *thirty days from* the date of sale.

The tickets will be honored between Chicago and Kansas City, St. Joseph or Atchison, for continuous passage only. Once a passenger has crossed the Missouri River he can arrange with the train conductor to stop at any and all points west thereof embraced within the limit of his ticket. He can use the full limit of his ticket (30 days) in such way as best suits his convenience, as no restriction is placed upon the date that he must reach the ultimate destination of his ticket or return therefrom.

In Kansas a great advantage is offered by the Sante Fe Route by reason of the fact that these excursion tickets will be good going by one of the Sante Fe lines and returning by another.

Remember that the Sante Fe Route runs the fastest train from Chicago to Kansas City, and that this fast train is "The Handsomest Train in the World." It is praised by every one.

Now is the time to visit Kansas the Banner State of the year in the production of wheat and corn.

Call on your nearest ticket agent for rates and maps, and if you wish any further information call on or address

F. T. HENDRY, *P. A.*,
Room 10, Jackson Place,
J. J. BYRNE, *A.G.P.A.*, Indianapolis, Ind.
Chicago, Ills.

THE LINCOLN HISTORY.

THE CLOSING CHAPTERS IN THE "CENTURY."
THE GREAT SUCCESS OF THE SERIAL.

Following upon the July chapters of "The Life of Lincoln"—which, as already announced, describe the President's renomination and Mr. Greeley's self-suggested peace trip to Niagara—there will probably be only six more installments of this remarkable history in *The Century* series. It is said that these concluding chapters deal with the most important and absorbing personal and political topics, to which Messrs. Nicolay and Hay bring a vast fund of special information. Lincoln's sagacity in dealing with men and measures (and occasionally his humor) come out in strong relief in the chapters that give the inside view of the attempt of the radicals to defeat the renomination of the President, of the disagreements resulting in Cabinet changes, of Chase's appointments to the chief-justiceship, and of the executive dealings with the "copperhead" conspirators at the North. No part of the work will attract wider attention than the account of the measures adopted by the religious denominations in support of the administration, and of the sympathy and wisdom with which the President met the suggestions of the churches. Of the interest of the last three installments it is only necersary to say that they cover the period from the second inaugural to the death of Lincoln and the collapse of the rebellion.

The publishers announce that the back numbers of *The Century* from November, 1886, containing the intsallments of the Lincoln History are now all in print and can be supplied to those who wish to complete their sets. Of several of these numbers two hundred and fifty thousand copies have been printed.

The Midsummer number of *The Art Amateur* is before us, as bright and attractive as ever. Two excellent colored plates are given away with this number; "Carnations," by Dangon, and "Illuminated Initials," from French manuscripts of the XIII century. The frontispiece, a very masterly decorative design, after Boucher, representing "Earth," is the first of a series of four which will be published consecutively. To those interested in china painting, we would recommend a perusal of "Letters to a Young Lady," while Amateur Photographers can gain information from Burbank's "Talks." A special feature of this August number is a full and comprehensive tabulated report of the Secretan Sale in Paris. Montezuma in "My Note Book," and Theodore Child, in the "Paris Expoition," very fully and conclusively describe the pictures at the Paris Centennial Exposition. MONTAGUE MARKS, Publisher, 22 Union Square, New York, N. Y.

NEW ADVERTISEMENTS.

Mitchell Compressed Air Oil Burner Co.,
Oil Burner.
F. H. C. Mey,
Clay Elevator and Conveyor.
The Continuous Kiln Co.,
Combined Dryer and Kiln.
I. & M. Wolff & Coleman,
Brick and Tile Dryers.
Jonathan Creager's Sons,
Brick Machinery.
R. B. Smith—Clay Pulverizer.
Small ads., "Wanted, For Sale, Etc."

Jonathan Creager's Sons, of Cincinnati, Ohio, manufacturers of the Grand Automatic Brick Machine, report the following sales since our last issue: One S. P. Machine, F. C. Whitney, Watertown, N. Y.; one "Special" Extra Heavy S. P. Machine with Pug Mill and Sander, for paving blocks and fire brick, John Porter, New Cumberland, W. Va., (his fifth machine); one S. P. Machine, M. Hochsderffer, Central City, Ill.; one Fire Brick Special, Wheeling Brick Co., Bridgeport, O., and one H. P. Machine to Stevens & Bucher, Ogden City. Utah, in addition to their steam plant now in operation.

If merchants want Bible authority for advertising they will find it in Numbers, xxiv, 14: "Behold, I go unto my people; come, therefore, and I will advertise."—*Kingston Freeman.*

HARVEST EXCURSIONS.

Via Vandalia Line---One Fare for the Round Trip.

To all points west of the Missouri River, Aug. 6 and 20, Sept. 10 and 24 and Oct. 8. The Vandalia is the popular and direct route to all points west. Make your arrangements to go by this line. For rates, maps and particular information, apply to George Rech, ticket agent, corner Washington and Illinois Streets, or at the Vandalia ticket office, opposite the Union Station, or address

H. R. DERING, Ass't Gen'l Pass. Agent
Vandalia Line, Indianapolis.

THE DETROIT EXPOSITION.

The Interest in the Progress of the Great Project Does Not Abate.

The number of visitors to the grounds of the Detroit Exposition increases daily, as the preparatory work progresses. The main building now shows up well from the river. Its frame work is all up except the tower on the southern front; a large part of the roofing is done and much of the siding is on. The painters have begun their work on the eastern face and the tall towers, and have covered a long stretch of the southern face, and the bright red of the tower pinnacles and of the roofs makes a striking and pleasing contrast with the pale straw color of the sides, giving an idea how attractive the building will be when completed. The art gallery frame is up and the roofs and sides are on many of the dozen acres of cattle stalls, barns and warehouses. The grading of the grounds proceeds vigorously. Workmen are now excavating for the artificial lake and constructing the driving tracks around it. The long stretch of piling along the river now extends nearly across the whole front, and will form a splendid esplanade when completed, with wharves and docks for all sizes of vessels and boats, from the 3,000 ton steamship down to the smallest yacht. The number of ladies among the visitors noticeably increases and they show much interest in the operations of the army of workmen and teams upon the buildings and grounds and the big pile driving machines on the river front. The painting also serves to bring out the graceful proportions of the main building. No one who has not visited the place can have any adequate conception of the grand scale upon which the enterprise of Detroit is preparing for the reception of the great crowd of expected visitors in September.—*Detroit Free Press, July* 17.

The C. H. & D. being direct line will have reduced rates.

THE CINCINNATI CORRUGATING CO'S MOVE.

Piqua, Ohio, the new home of the Cincinnati Corrugating Co., where will be located the extensive rolling mills and works of this concern, for the manufacture of Iron and Steel Roofing, Etc., is described as advantageously located on the great Miami River, and Miami and Erie Canal, at the junction of the Cincinnati, Hamilton & Dayton, and Pennsylvania Lines, about 80 miles north from Cincinnati. Although its more recent growth has been rapid, stimulated, as it has been, by the introduction of a lavish supply of natural gas from the Mercer fields near by, it has long possessed the elements and make-up of a first-class modern city.

Its population, of some 15,000, is composed of thrifty mechanics, active business men, and substantial citizens generally. The manufacturing industries of the place, represented by upwards of 40 factories, rank high with those of much larger cities. In the items of furniture, linseed oil, and others, Piqua stands second, only, in the United States, while her spacious electric lighted streets, well kept parks, and beautiful adjacent lakes, her celebrated "hydraulic" system for water works and power, as well as the fine rolling and fertile country around, form a constant attraction to people of taste and means who are looking for a desirable place for residence and business purposes.

But what has done more for Piqua than gifts of nature or accident of location, is the broad and liberal enterprise of her business men, backed by the wholesome public sentiment of an unusually intelligent community. Fortunately for Piqua the efforts of her most energetic public spirited citizens have been put forth for solid benefits, and not for effect or mainly for selfish interests, as in too many instances.

An appropriate addition to this model city will be the plant of the model rolling mills and roofing establishment of the country, if not of the world—that of the Cincinnati Corrugating Co.

OUR 1889 CATALOGUE

Is in Printer's hands. Parties desirous of obtaining same will please forward their address at once to insure prompt mailing. Address,

Link-Belt Machinery Co.,
CHICAGO & MINNEAPOLIS,

---OR---

Link-Belt Engineering Co.,
NICETOWN, PHILADELPHIA, PA., &
49 DEY ST., NEW YORK, N. Y.

[Mention the Clay-Worker].

To Brick and Tile Burners

CRUDE OIL AS FUEL FOR THE FIRING OF KILNS OF ALL KINDS WITH THE MITCHELL COMPRESSED-AIR OIL BURNER.

Within the past year we have applied our Air Burner to Brick Kilns for the burning of brick with crude oil as a fuel, and the results have been so very satisfactory that we are warranted in now offering our burner as the most successful one for this purpose, as well as for most others.

We are now prepared to fit out kilns of any size, and can assure customers that they will be satisfied with the apparatus. The advantages of our burner over all others are many and result from the use of compressed air for the operation of the burner in place of steam, which is used in all other burners.

The advantages may be stated as follows:

1st. Our fire is always under complete control.

2nd. Our burner remains lighted with a small fire, in a cold, damp arch. No steam burner, that we know of, will produce a sufficiently small and gentle fire for the early stages of brick burning.

3d. We require no specially constructed furnace or kiln. We can apply the burner directly to the arches without furnaces, or to any style of furnace.

4th. The drying off process is much more quickly and cheaply accomplished with our burner because we avoid blowing out steam into the bricks; we use only air.

5th. We make a saving of from two to three days in the time required to burn a kiln.

6th. It only requires one man to each shift to attend to the entire kiln.

7th. Our burner does not crack or melt the arches and yet it burns the kiln hard to the top course.

8th. The fire set at any desired strength in an arch will remain at that strength until altered by the operator.

It is useless to attempt to state the time required to burn a kiln, or the amount of oil needed, because clay differs greatly in different localities; bricks are set to different heights, and bricks are burned to different degrees of hardness and the amount of fuel required varies accordingly.

To burn the whole kiln into good, hard bricks with average clay will require about one barrel or 40 gallons of crude oil per thousand brick; or 40 gallons of oil about equal 10 bushels of good Pittsburgh coal.

Upon investigation, you will find that this is better than is done by any other burner, and for the advantages as mentioned above, you will find our burner to be in every way superior to all steam burners.

We have fitted up the Cincinnati Brick Co. yards near Addyston, Hamilton Co., Ohio, on the C. I. St. L. & C. Railway, (Postoffice address, Johnston Building, Cincinnati, Ohio) and that Company has burned about two and one-half million brick with our apparatus. Anyone will be welcome at their yard to see the burner in operation, and the foreman, Mr. A. C. Spahr, or the Company will give all the information desired. In the case of this Company, we run not only the kilns, but the boilers and all the machinery on the place. For terms and information, address

Mitchell Compressed-Air Oil Burner Company,
P. O. Box 188,
CINCINNATI, - - OHIO.

FOR SALE, WANTED, ETC.

☞Advertising rates in this column 20 cents a line, or 3 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion.☜

FOR SALE. Brickyard and bed of fine clay at Kansas City, Mo. Address Box 57,
8 2 c. Care Clay-Worker.

WANTED Capital to join in manufacture of superior Pressed Brick and Terra-cotta. Demand unlimited. Address Box 55,
8 2 c. Care Clay-Worker.

FOR SALE. One Eagle Brick Machine, one Fletcher & Thomas Pug Mill and 20,000 pallets, all in good order, cheap. G. BRICK, STONE & LIME CO.,
8 1 c. Greencastle, Ind.

WANTED. A situation by an experienced and reliable brickmaker and burner. Familiar with old and new methods of burning. Address
7 tf t. "BRIX," Care Clay-Worker.

FOR SALE. Clay land on track; unlimited cash demand for brick in Duluth, St. Paul and Minneapolis. Address F. MCNAMARA,
5 6 c. Little Falls, Minn.

FOR SALE. New Quaker Brick Machine, entirely new. Used only two weeks. Address
J. W. SHELLENBERGER,
8 1 d. Duluth, Minn.

FOR SALE. Bennett Brick and Tile Machine, nearly new. No. 4 Penfield Brick and Tile Machine in good order. Four complete tempering wheels for steam power. WM. E. HINCHLIFF,
8 tf d. Room 3, 159 La Salle St., Chicago, Ill.

BRICKMAKERS making soft mud brick can learn of a way to burn their brick for half their present cost, if they are where soft coal can be bought cheap. (No mixing coal in brick.) Address,
Box P,
8 tf. t. Care Clay-Worker.

WANTED. A partner in an established fire front and ornamental brick works in the vicinity of New York City. The location and natural advantages are such as to defy competition. Address Box 220,
8 3 d. Woodbridge, N. J.

FOR SALE. One Whittaker Semi-dry Brick Machine; one Stedman Pulverizer; one Bucket Elevator; all in good order, having made only about 600,000 brick. J. M. HARRY & CO.,
2 6 5p. Dallas, Texas.

WANTED. A position as foreman by a practical brickmaker in a brick or tile yard. Has had 25 years experience in handling clay in all its forms of manufacturing and can furnish good references. Address
7 1 p tf. S. K. T., Care Clay-Worker.

WANTED. Situation by a first-class terra-cotta and face brick burner and setter, understands all kinds of muffle kilns and can do all repairs.
Address MARK P. GOLDEN,
8 1 c. Medford P. O., Mass.

CLAY FREE. Large quantities of fine red clay can be loaded direct from bank to cars on Indianapolis & St. Louis R.R., free to anyone who will remove it.
GREENCASTLE BRICK, STONE & LIME CO.,
8 1 c. Greencastle, Ind.

WANTED. Position as superintendent in a brick yard by a thoroughly competent and reliable man. Understands making mud brick, wire-cut and dry-press process, but would prefer the latter. Can burn with wood or coal. Address D. PRESS,
7 tf t. Care Clay-Worker, Indianapolis.

FOR SALE OR RENT. Brickyard near Richmond, Va. 21 acres, railroad switch to the kilns, abundance of best clay, new buildings, sheds, clamps, wheels, moulds, barrows, mules, carts, etc. For information, apply to JOHN C. GIBSON,
Richmond, Va.
4 6 c. or J. J. Gordon, P. O. Box 228, Cincinnati, O.

FOR SALE. One New Departure Brick and Tile Machine with pallets and brick dies. One 50 h.p. engine, and boiler with pumps and line shaft belting; complete outfit. Also one Brewer-Tiffany Tile Mill and two roll crushers; one 15 h.p. engine and boiler with pumps, all in good order. B. F. TOWNSLEY,
9 ~~8~~ tf d. Aledo, Ill.

FOR SALE. One-half of an Oven Kiln Brick Yard, 16,000 daily capacity. Brick cost $5.00 and sell from $8.00 to $10.00. Have poor health—MUST SELL. Price $8,000, one-half cash, balance on time, or will take brick. Possession at once. A million brick sold ahead. JAMES F. ZEDIKER, Box 86,
~~8 1 4 d.~~ Grand Island, Nebraska

8. 4. C

Mention THE CLAY WORKER
When writing to advertisers
Mention THE CLAY WORKER.

SKINNER ENGINE CO.

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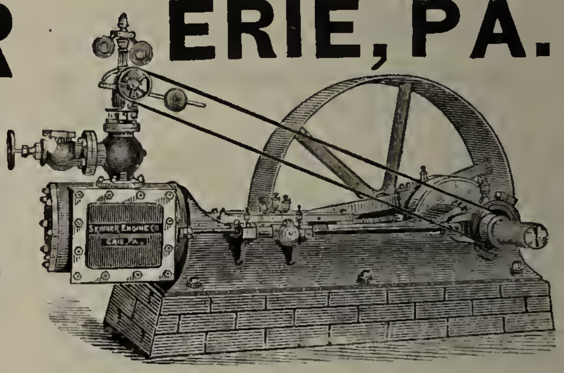

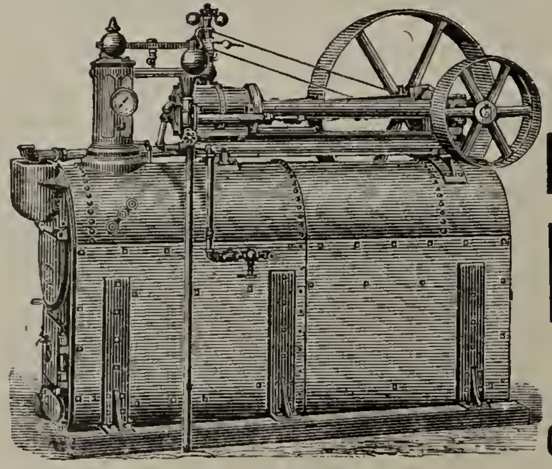

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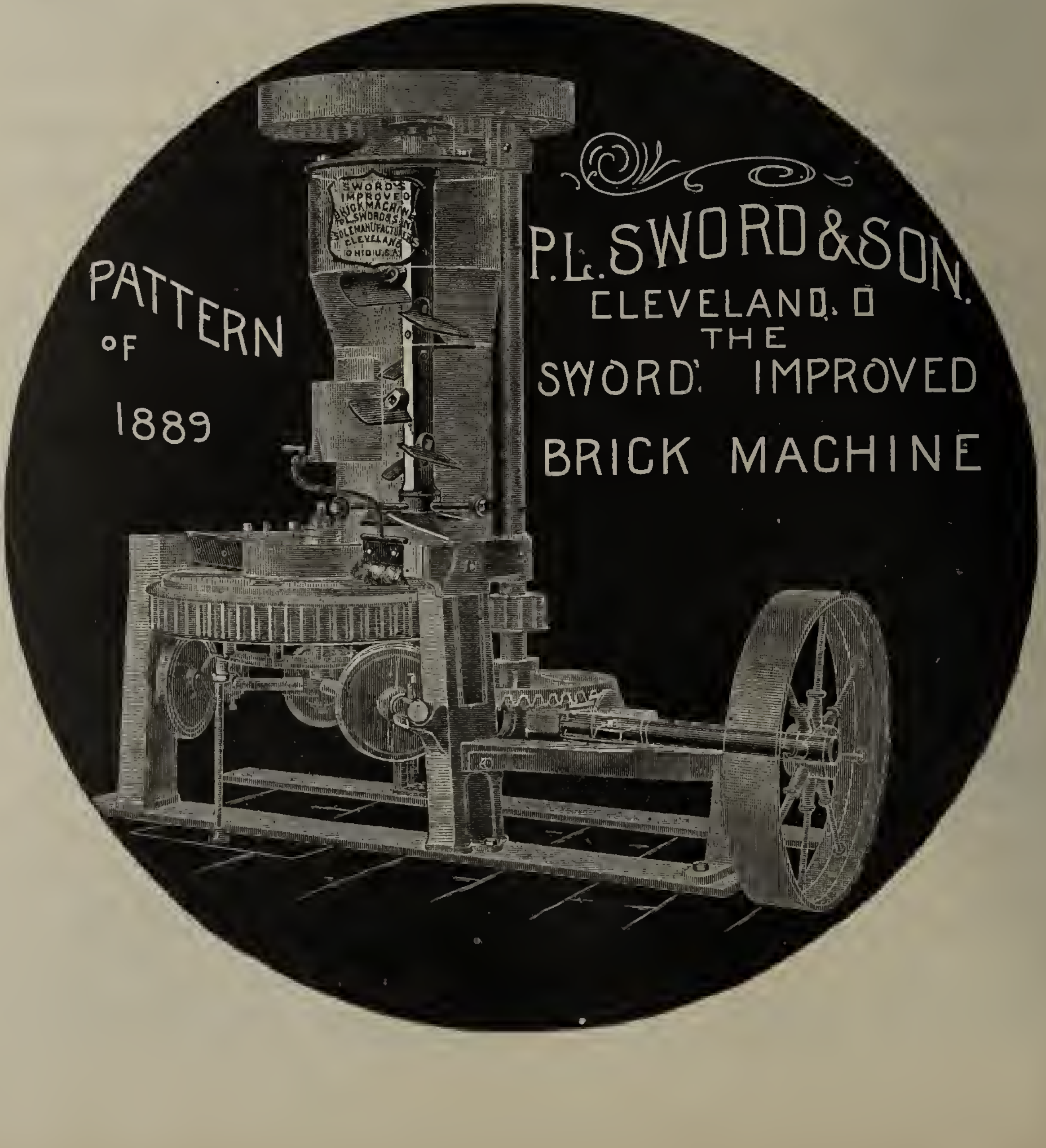
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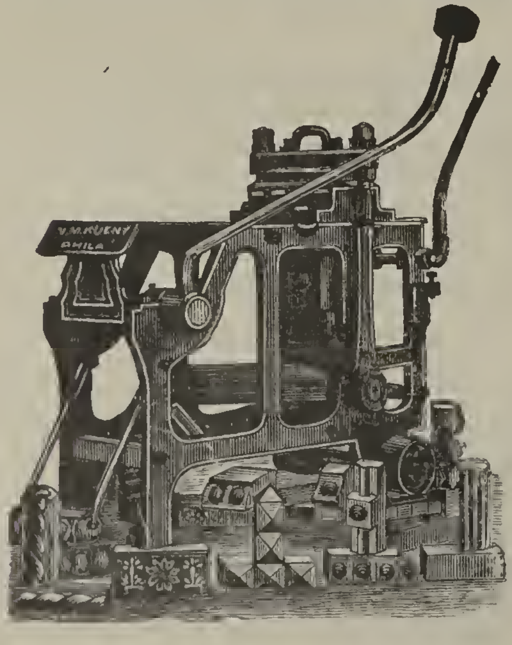

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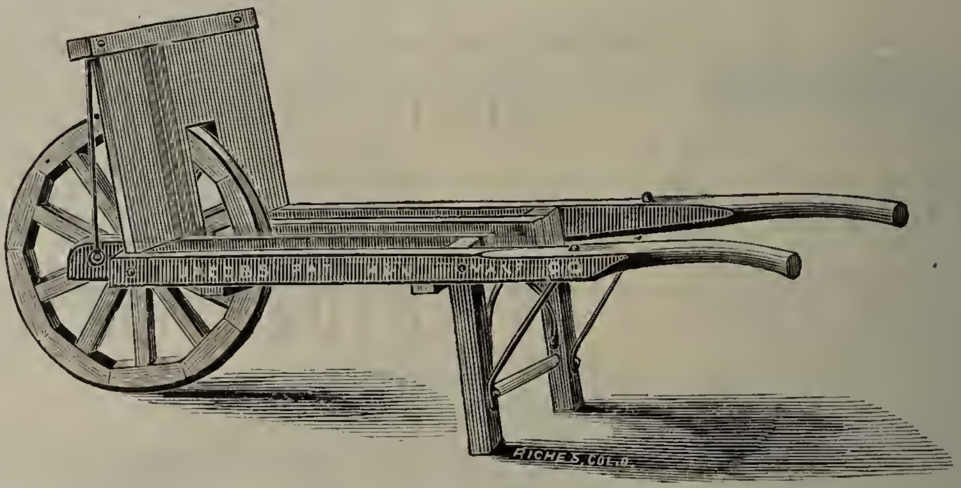
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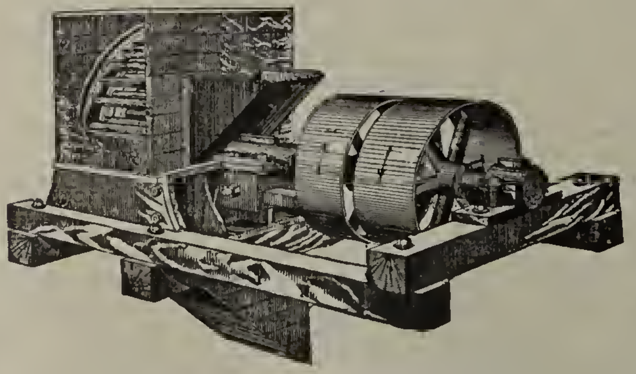

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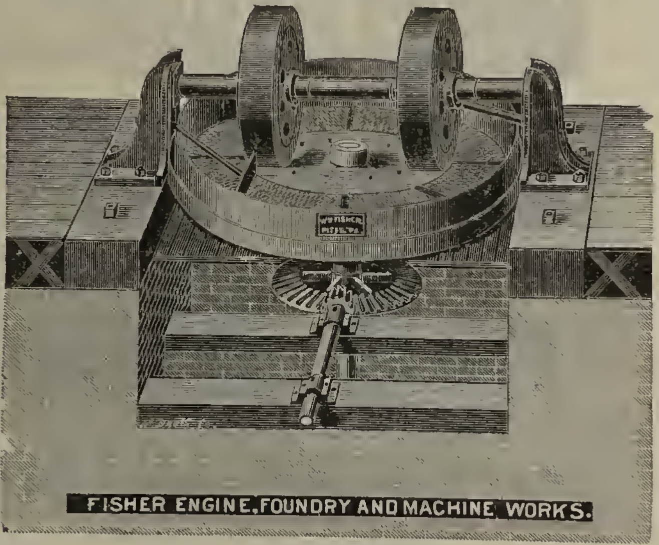
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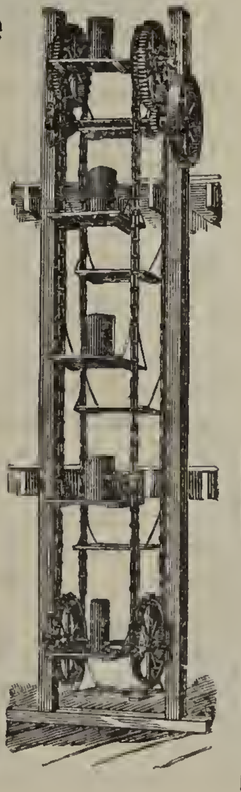

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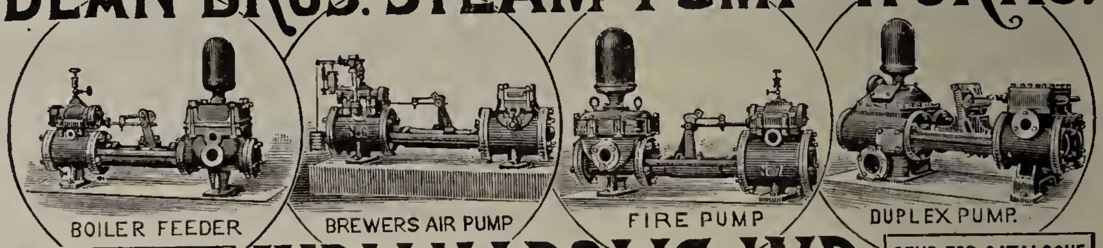

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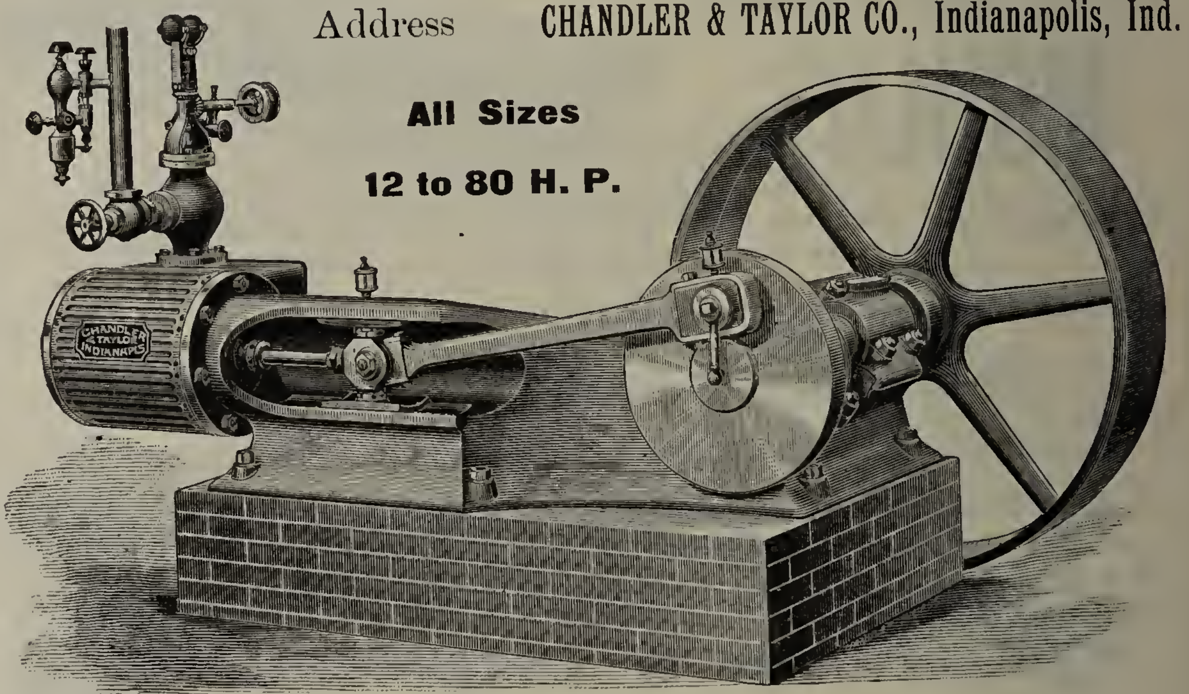

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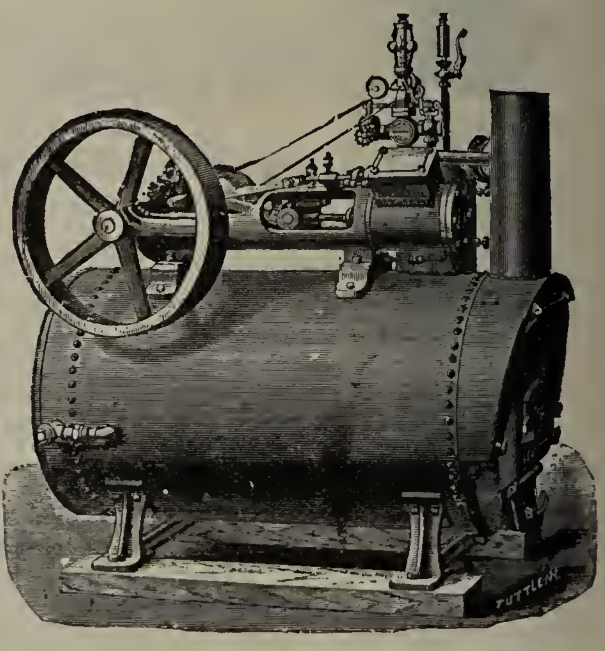

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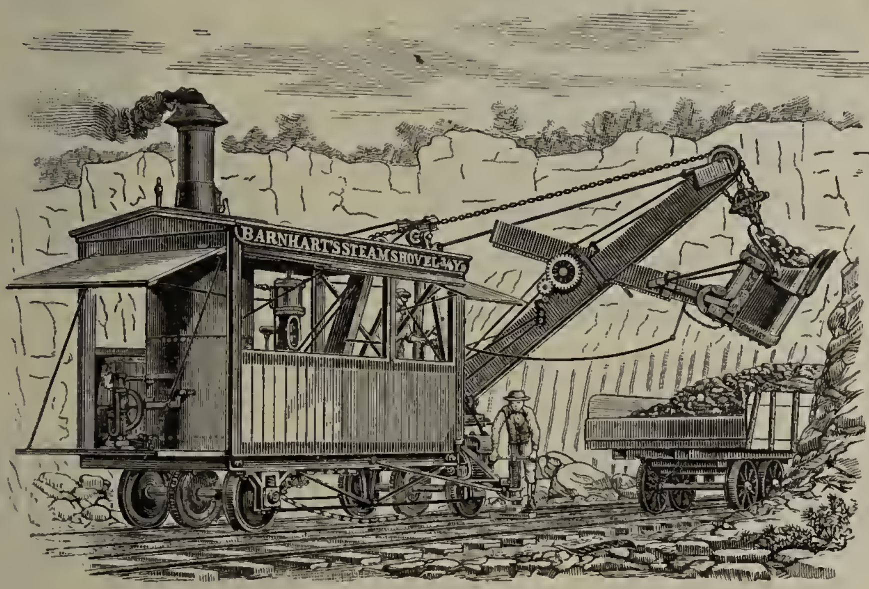

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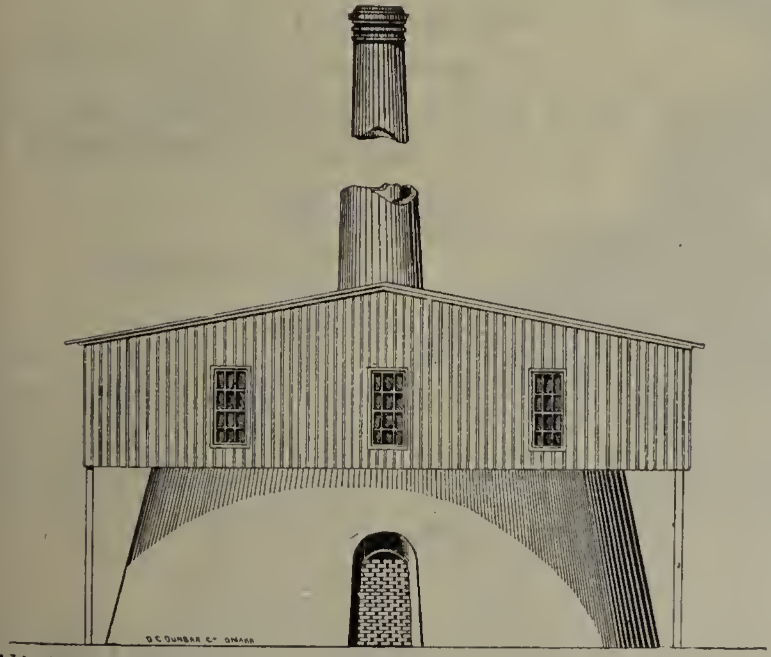

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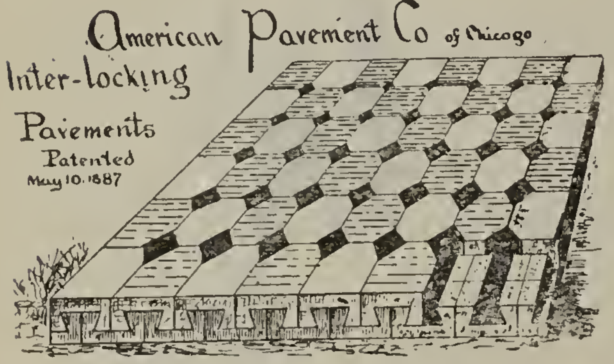

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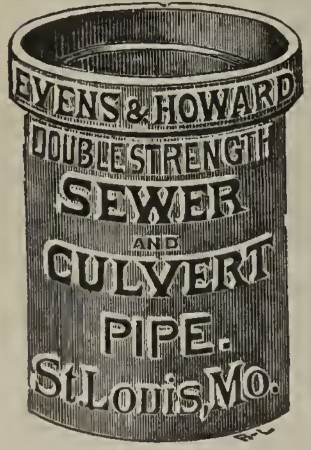

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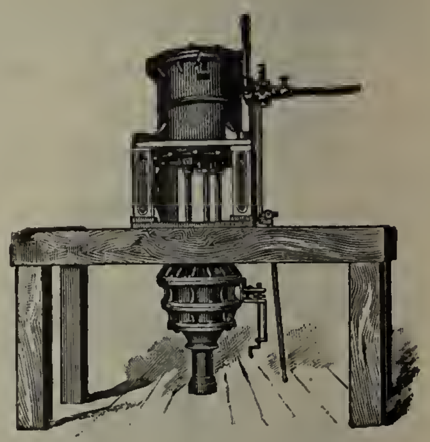

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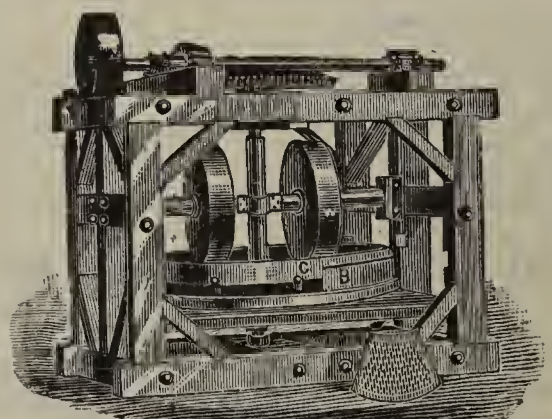

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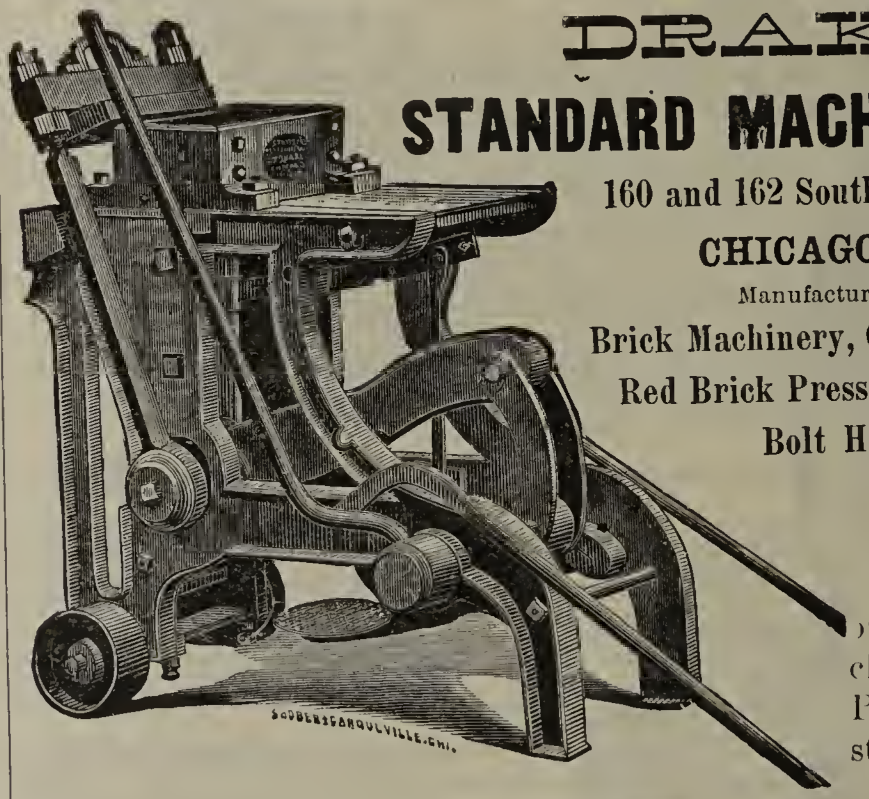

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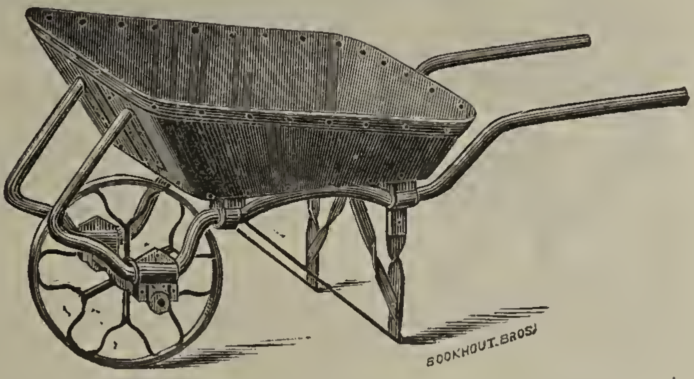
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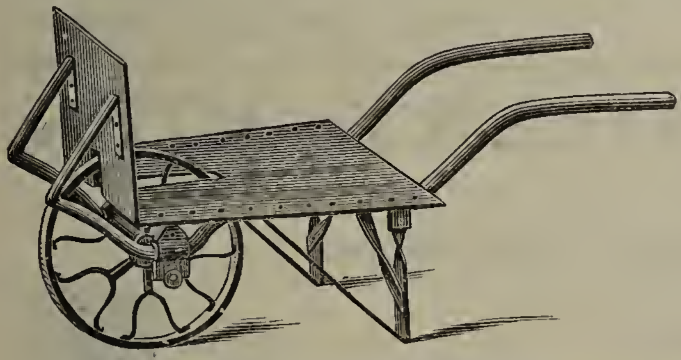
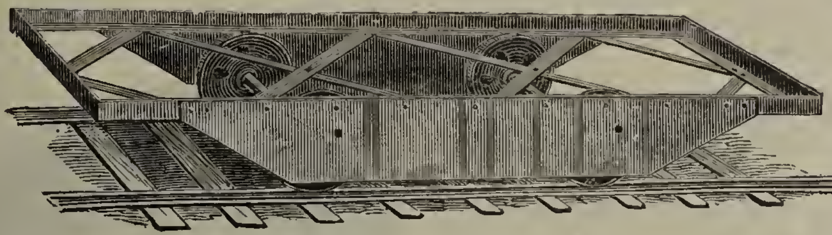
Our Barrows are used largely by the brick manufacturers in New Jersey and along the Hudson River. For our Drying Cars we refer to the Lorillard Brick Works, Keyport, N. J., and for our Pallets to Perth Amboy Terra Cotta Works, Perth Amboy, N. J. Send for illustrated catalogue and price-list.



BARROWS FOR GREEN BRICKS.

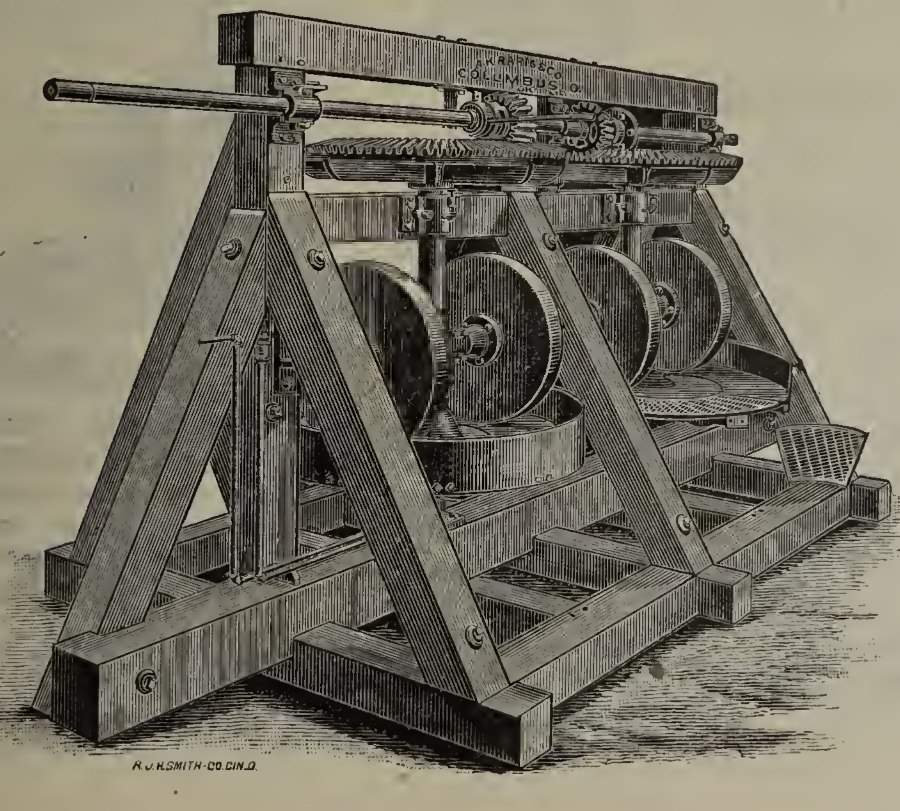


WROUGHT IRON BRICK CARS.

We do STAMPING and PRESSING of sheet metals for all classes of work. Also TINNING, GALVANIZING and JAPANNING.

ALEX. K. RARIG & CO.,

Founders, Machinists and Boiler Makers, Columbus, O.


A. K. RARIG & CO.
COLUMBUS, O.
R. J. K. SMITH-CO. CIN. O.

Office and Works:
Cor. Water and
Chestnut Streets,
near new Union
Depot.

Steam Sewer Pipe and Tile Presses, Grinding and Tempering Pans, Sewer Pipe, Tile and Fire Proof Dies, etc.; Automatic Cut-off and Slide Valve Engines, Boilers, Pulleys, Hangers and Shafting, Steam Pumps, Pipe Fittings and Architectural Iron Work.

MONON ROUTE

LOUISVILLE, NEW ALBANY & CHICAGO RY.

The Shortest and most Direct Route from

INDIANAPOLIS

TO

Frankfort, Delphi, Monticello, Michigan City,

CHICAGO,

And all points in Northern Indiana, Michigan, Northern Illinois, Wisconsin, Iowa, Minnesota, Nebraska, Kansas, New Mexico, Dekota, Nevada, Colorado, California, and Oregon.

2 Through Solid Trains Daily

From Indianapolis to Chicago; also, Michigan City, Elegant Pullman Sleeping Cars on Night Trains. BAGGAGE CHECKED TO DESTINATION.

No route can offer you any better accommodations or lower rates than we can. Road and equipments first class. Steel Rails, Miller Platforms and Buffers Air Brakes, and all modern improvements. Superior advantages to Western Emigrants. Land and Tourists' Tickets to all points reached by other lines. If you are going West, Northwest or North, do not purchase your tickets until you have seen our time folders or called upon us.

For full and reliable information, Tickets, or Sleeping Car Berths, please call on or write to

I. D. BALDWIN, District Pass. Agent,
Office, 26 South Illinois St., Indianapolis, Ind.
E. O. McCormick, Gen'l Passenger Agt.
CHICAGO, ILLS.

THE PRINCIPAL AND BEST ROUTE TO THE WEST IS

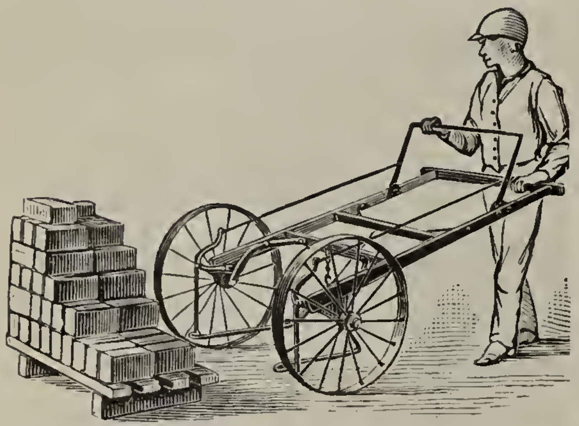
The Vandalia Line,

And the reason for it being, is apparent to all those who travel between the East and the West. It's trains run solid from Indianapolis to St. Louis, and the service is conceded to be unequalled. Comfortable day coaches, that are kept tidy and clean, handsome and elegantly furnished parlor cars with easy sofa chairs go to make the trip from Indianapolis to St. Louis a pleasure rather than a hardship. Pullman sleeping cars are run on day and night trains, a local sleeper is also run for the convenience of local travel between Indianapolis and St. Louis, and passengers can get into the car at or near the Union Station any time after 8:30 P. M., and will not be disturbed until St. Louis is reached at 7:00 A. M. Rates are always as low as by less important routes. Through express trains run as follows: Leave Indianapolis 7:30 A.M., 11:55 A. M., 11:00 P. M. Arrive St. Louis, 5:00 P. M., 7:30 P. M. and 7:00 A. M., respectively.

Before making arrangements for a western trip, be sure to write or call upon.

H. R. DERING,
Ass't Gen'l Pass. Agent, Vandalia Line,
48 W. Washington St.,
INDIANAPOLIS, IND.

STEELE'S IMPROVED
Brik Truck
—AND—
Portable Hack.



The principle of handling and drying bricks by the Portable Hack System has been perfected in this Truck and VENTILATED HACK BOARD, being the most practical Truck and method ever yet introduced, saving labor in handling and time in drying bricks. Can be used in any yard not too steep. Is especially adapted for medium dry clay machines.

☞Is fully warranted to work as represented.

Orders Solicited.

Territory for sale in the Northern and Western districts. Address,

J. C. STEELE, Patentee,
Statesville, N. C.

Queen & Crescent Route.

Cin. Southern and Associate Roads.

DIRECT

AND

Most · Picturesque · Route SOUTH.

DOUBLE DAILY SERVICE OF FAST THROUGH TRAINS

From Grand Central Union Station, CINCINNATI,

For Chattanooga, Knoxville, Memphis, Birmingham, Meridian, New Orleans, Vicksburg, Shreveport, Mexico, Texas and California.

CINCINNATI TICKET OFFICES:

West Fourth Street near Vine, and Grand Central Union Station.

OHN C. GAULT, Gen'l Manager.
R. CARROLL, Gen'l Superintendent
D. G. EDWARDS, Acting General Pass. Agent, Cincinnati.

—FOR—

Tile and Brick Yards.

For handling Coal, Sand, Clay, Grain, Tan-Bark, Cinders, Ores, Sawdust, Lime, Cement, Shavings, Cotton-Seed, etc.

IOWA PIPE AND TILE CO.,
Des Moines, Iowa, Sept. 24. 1887.

Borden, Selleck & Co., Chicago. GENTLEMEN—We have used the Harrison Conveyor for the past two years. It takes about 90 tons of clay per day from our dry pan and distributes it through our cellar. Gives good satisfaction. Yours Truly, IOWA PIPE & TILE CO.

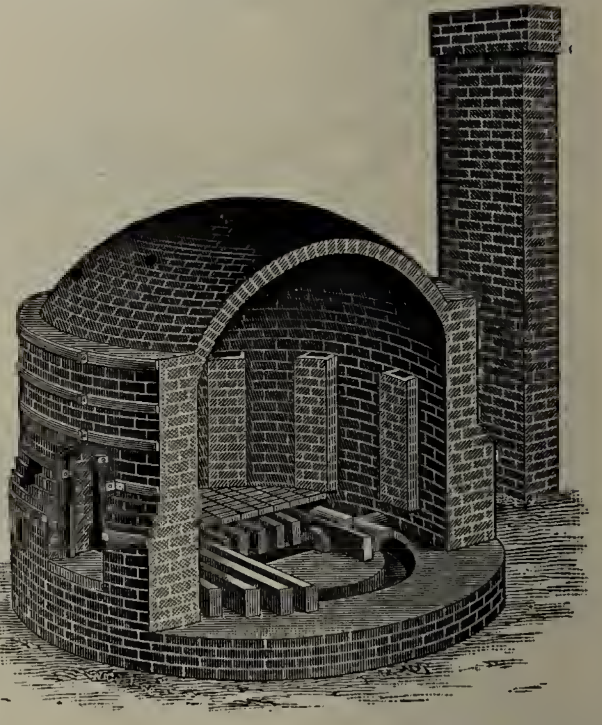
BORDEN, SELLECK & CO., *Mfrs. and Sole Agents,*

Send forillustrated catalogue. **48 & 50 Lake Street, CHICAGO**

"NEW DISCOVERY" KILN.

PIKE & SCHOPP, INVENTORS.

It Heads the Procession!



The "New Discovery" is a round down draft kiln with no grates, furnace doors, sub-arches or dampers, except at the stack, bound with iron bands, securely fastend to an arched irn door frame. This kiln is the result of years of experience by practical and successful tile and brickmakers, at a cost of thousands of dollars.

It is a conceded fact that perfect drafts and perfect combustion are indispensable to a perfect kiln. *Such* is the "New Discovery." This kiln is adapted for burning almost anything made from clay; can be constructed for either wood or coal and burn evenly throughout; is easily managed—will save in fuel, time of burning, wages of the burner, use of the kiln—nearly one-half.

The proprietors of this invention propose to sell kiln yard or territorial rights reasonably and guarantee it to be the best kiln the purchaser ever saw or used.

Everybody is cordially invited to visit our works, where a kiln is, almost, in constant operation. We also nave an arched iron door frame which is indispensable to a perfect kiln.

Send for circulars and testimonials.
We shall protect our patents from infringements.
Reliable resident agents wanted. Address—

PIKE & CASTLE, Chenoa, Ills.

3000 TO 4500
Gallons of Water (per hour.)
BY HAND-POWER.

Pumps, Hand-Power Pumps

(LOUD'S PATENT.)

These pumps are simple, durable and low-priced.

A large capacity and easy working pump for **Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries,** or wherever it is desired to raise a *large quantity* of water by *Hand-power.* The pump has large valves (*accessible by hand*) and will pump water containing *sand, gravel, mud, sewage matter, etc.,* without *choking* or any *perceptible wear.*

Send for circular and price-list. Manufactured by

THE UNION HARDWARE CO.,
TORRINGTON, CONNECTICUT.

Grant & Murray's Improved Brick Machine.

In placing this Improved Machine before the public and setting forth what we claim for the merit of the machine, we guarantee to fully verify in the practical operation of the machine.

This process of brickmaking has been thoroughly tested and has proven to be a perfect success, and is as cheap a process as any on the market. The machine is constructed wholly of iron and weighs upwards of twenty thousand (20,000) pounds. It is simple and durable. The operation of it is easily understood. Its capacity is two thousand (2,000) brick per hour. The brick are far superior in strength and finish to common brick. The clay is worked at a consistency that under pressure deposits the greatest amount of clay in the brick, giving them great strength and thereby making them especially adapted for street paving purposes. In actual tests where there has been the strongest competition there has not been a brick submitted that would stand near the pressure, absorb as little water, or stand the wear by friction as these brick.

If Brickmakers or those that are going into the business will send us a barrel of their clay we will fully demonstrate the quality of the brick in this respect.

Not having sufficient capital we desire to dispose of an interest in the patent and business generally to some one, or company that would have sufficient capital to push the manufacture and sale of this machine as the merit of it would justify or demand.

We ask the attention of manufacturers desiring a specialty to the above, with a view to the manufacturing of the machines.

Machines can be furnished on short notice. Correspondence solicited. For further particulars, prices, etc., address

GRANT & MURRAY,
Middleport, Ohio.

Mention the Clay-Worker].

EAGLE BRICK MACHINE

Steam and Horsepower.

THE BEST MACHINE IN THE MARKET.

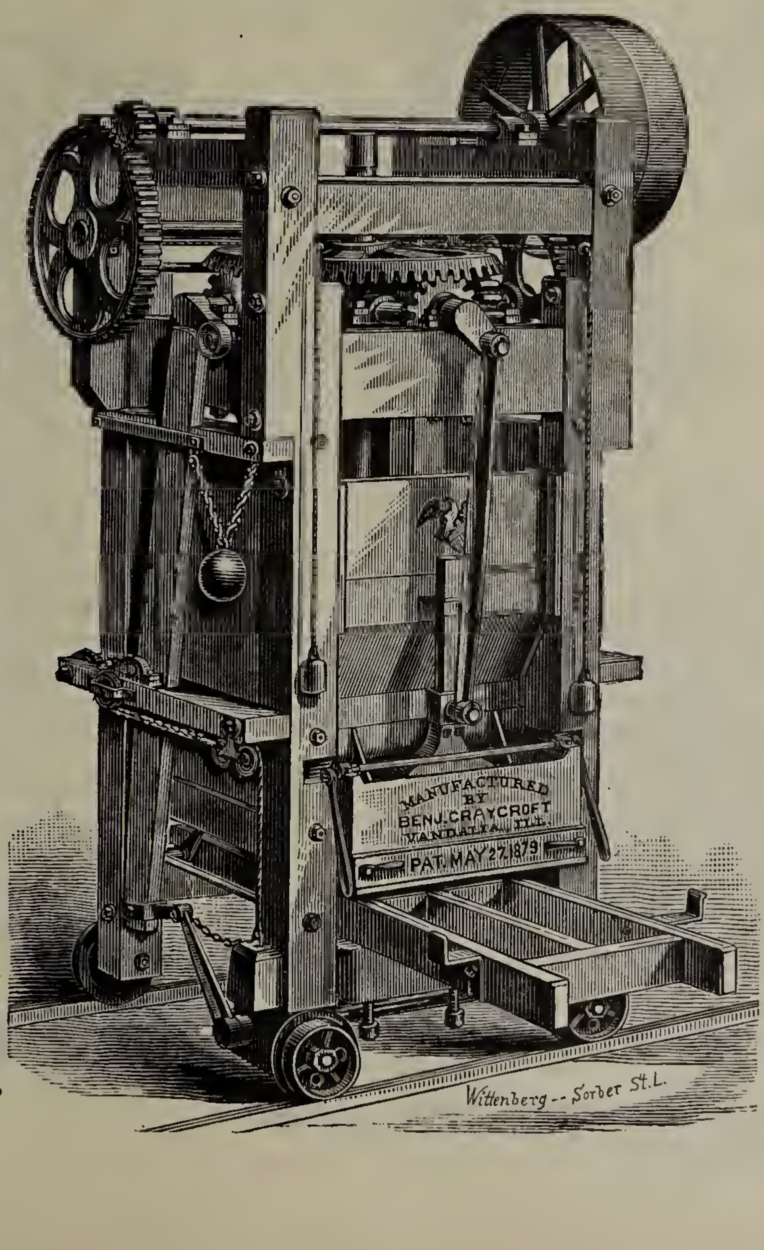
The Horsepower Machine will make 17,000 to 20,000 brick per day; the Steam-power Machine, 25,000 to 30,000.

These Machines are sold on their merits, guaranteed to do first-class work.

Send for Circular.

BENJ. CRAYCROFT
Manufacturer,
Vandalia, Ills.

C. J. CRAYCROFT, Fresno City, Cal., Gen'l Agent for Pacific Coast.


MANUFACTURED BY BENJ. CRAYCROFT VANDALIA, ILL.
PAT. MAY 27, 1879
Wittenberg -- Sorber St. L.

The GREAT B&W Route

THE SHORT LINE
Both East and West

The only line with solid trains to Bloomington and Peoria with Through Cars to principal Missouri River points in several hours less time than any other line. The short line to Springfield, Columbus, Ohio, and all points in Southern and Eastern Ohio. The Quickest and Only Route with Through Chair Cars to Urbana, Ohio, Bellefontaine, Kenton, Tiffin and Sandusky. The authorized differential route East with Quick Time and Through Tickets to Principal Eastern Cities from $1.00 to $1.50 less than regular rates. Trains at Indianapolis Union Station

Leave { Going East *4 00 am. 3 00 pm.
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Arrive { From East 11 45 am *10 50 pm.
Arrive { " West *3 40 am. 2 40 pm. *6 30 pm. 10 15am
*Daily.

All trains have the finest of Buffet Sleepers and Reclining Chair Cars. For tickets and full information, apply to Geo. Butler, Gen'l Agent at the Union Station, 42 Jackson Place (opposite main entrance Union Station) Indianapolis, or to any Agent on the line.

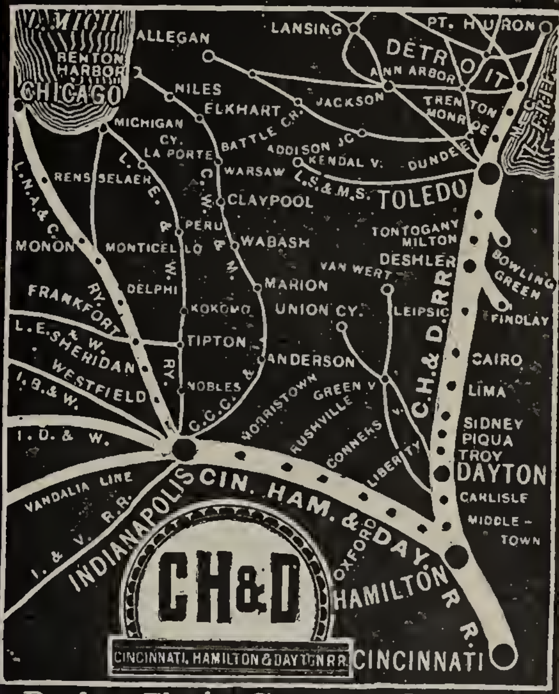
Look in local columns for special notices of excursions, reduced rates, etc.

H. M. BRONSON, Gen'l Pass. and Ticket Agent,
Indianapolis.

CH&D

CINCINNATI, HAMILTON & DAYTON.

THE THROUGH CAR LINE
FROM AND TO
Cincinnati, Indianapolis, Dayton, Chicago, St. Louis, Toledo, Findlay, and Detroit.



Parlor Chair Cars on Day and Sleepers on Night Trains "Year Round."

Reclining Chair Car Cincinnati to Decatur, Ills., Springfield, Ills. and Keokuk, Iowa, Daily.

For full information, Tickets, Sleeping Car space, etc., inquire of or address

W. H. FISHER, General Agent, Indianapolis, Ind.
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THE

Pan-Handle SYSTEM.

Its Territory, Facilities and Advantages Offered to the Traveling Public.

This system of railroads embraces the following lines: The Chicago, St. Louis & Pittsburgh railroad; the Jeffersonville, Madison & Indianapolis railroad, and the Indianapolis & Vincennes railroad.

The Chicago, St. Louis & Pittsburgh railroad is the Great Through Line to the East, via Columbus and Pittsburgh.

The Jeffersonville, Madison & Indianapolis railroad is the popular connecting link between the North, Northwest, South and Southeast.

The Indianapolis and Vincennes railroad is the direct and short line between the North, Northeast and the Southwest.

The facilities and advantages of the Pan-Handle System are in very particular in keeping with the progressive spirit of the times and the demands of the traveling public. Its facilities for the transportation of its patrons are sufficiently adequate to guarantee to all comfortable and pleasant accommodations.

The prominent advantages are its Through Coach and Sleeping Car service; Through Ticket and Baggage Check System; Prompt Connections and Speedy and Safe Transit.

Full information regarding Through Tickets, Rates and Movement of Trains can always be obtained from agents of the Pan-Handle Route.

Indianapolis offices: Union Depot and City Ticket Office, 48 West Washington St.

H. R. DERING,
Ass't Gen'l Pass. Ag't, Indianapolis, Ind.
JAS. McCREA,
General Manager, Pittsburgh, Pa.
E. A. FORD,
Gen'l Pass. Agent, Pittsburgh, Pa.

The J. D. & W. Ry.

Short Line to Kansas City and the West.

Lv Indianapolis	8.35 am.	11.00 pm. (daily.)
Ar Decatur	2.43 pm.	4.00 am.
Springfield	4.40 pm.	6.00 am.
Jacksonville	6.10 pm.	7.12 am.
Hannibal	9.35 pm.	10.40 am.
Quincy	9.50 pm.	10.45 am.
Keokuk	11.15 pm.	11.35 am.
St Louis	6.15 pm.	7.45 am.
Peoria	5.45 pm.	9.55 am.
Kansas City	7.10 am.	6.30 pm.

The only line runing reclining chair cars daily between Indianapolis and Keokuk, Ia., without change, running through Decatur, Springfield, Jacksonville, Chapin, Bluffs and Clayton, Ills. To Quincy, Ills,, and Hannibal, Mo., without leaving the train.

City Ticket Office, 134 South Illinois Street, Indianapolis.
H. A. CHERRIER, Ticket Agent.
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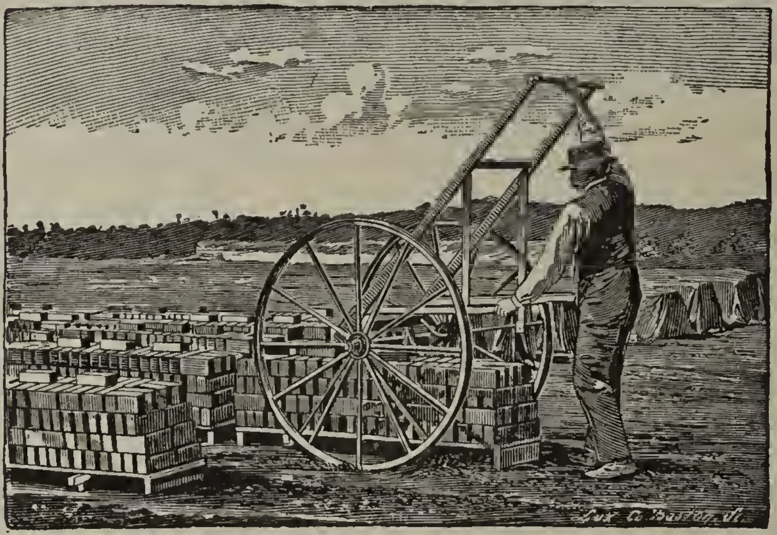
General Fr't and Tkt Agt.

Economy Portable Brick Hake.

Patented Sept. 22, 1885, Re-issued Feb. 23, 1886. By
M. WALKER and E. MINER, Yankton, Dakota.



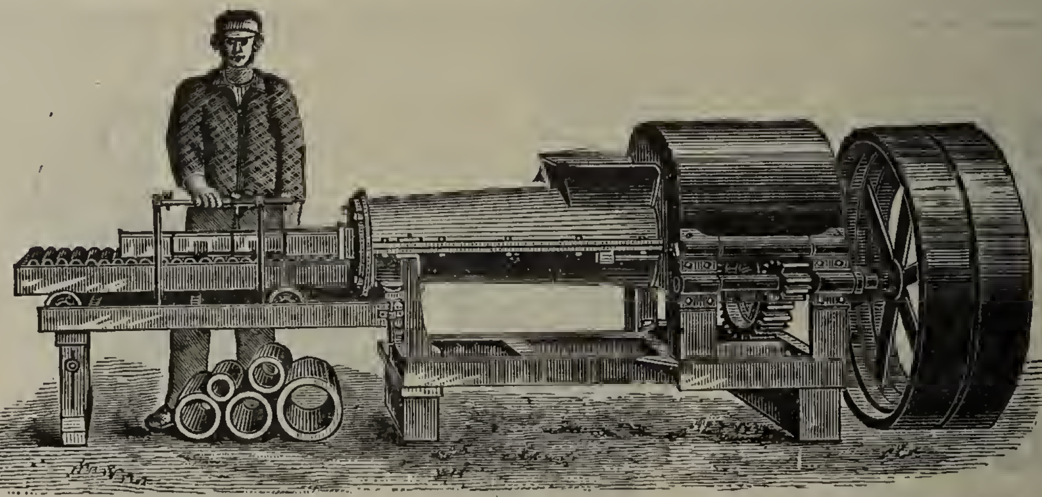
We desire to call the attention of all brickmakers to our PORTABLE BRICK HAKE, which certainly furnishes the cheapest and best means of handling brick from the machine to the yard, and from the yard to the kiln ever yet made use of. By this device the brick when taken from the machine are placed directly upon the haking boards, and when filled the haking boards are taken up by the truck and conveyed to the yard, where they are set down in rows end to end, where they remain until dry, when the truck comes again, picks up the hake of brick and takes it to the kiln. Thus one man does the work of four and the bricks go into the kiln in much better shape by not being handled while they are soft. We have a truck made especially for handling soft molded bricks on pallets. Yard County and State rights for sale. Please address for circulars and for further information,

YANKTON PRESSED BRICK CO.,

Or either of the undersigned, patentees,
M. WALKER, or E. MINER, Yankton Dakota.

KELLS & SON'S IMPROVED
Brick and Tile Machines!

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of Brick and different sizes of Tile by changing dies. For strength and durability we except none. We chalenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22, 1880; and February 12, 1884. We can furnish Crushers and also Trucks.

We can produce side cut Brick with our down cut-off, and make perfect edges and corners without the use of water or oil.

We have had Twenty-two Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 18 inches and on our No. 2 Machine we can make tile from 2½ up to 12 inches.

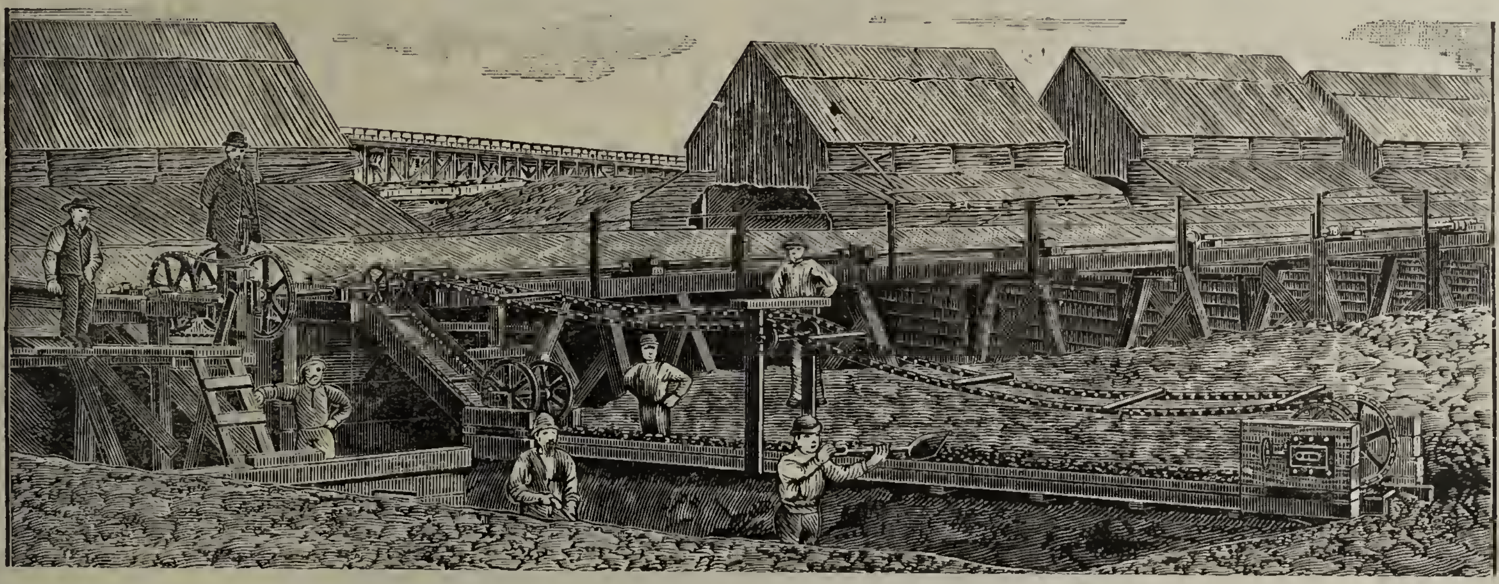
☛For Illustrated Circulars, Prices, etc., address

KELLS & SONS,

SHOP NEAR NEW COURT HOUSE. ADRIAN, MICH.

MEY'S CLAY ELEVATOR AND CONVEYOR,

This Elevator is for taking the clay into the brick machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.



It gives the machine a uniform feed, takes less power and manual labor to manipulate and the manufacturer is enabled to make many more thousands of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

It will carry either wet or dry clay and does not clog. There are many of them now in operation and giving satisfaction in every respect. For further particulars and for Catalogue, address

F. H. C. MEY, BUFFALO, N. Y., U. S. A.

THE NEW IMPROVED CHIEF BRICK MACHINE.

Patented Jan. 1, 1884, *April* 2, 1884, *and the new improvements of* 1887 *and* 1889.

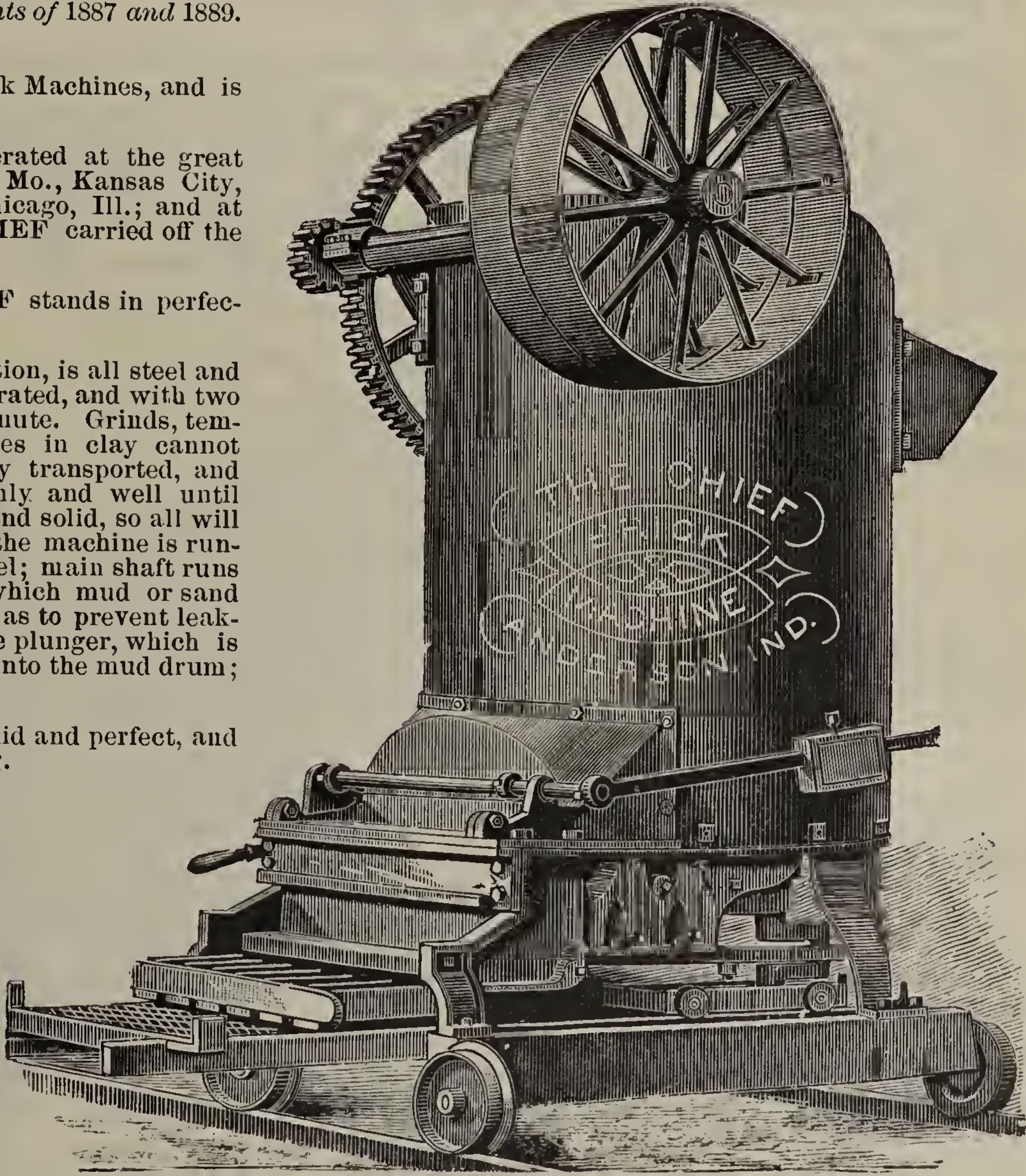
Has taken the lead and stands at the head of all Brick Machines, and is now in operation in every State and Territory in the Union.

In its original construction it was exhibited and operated at the great Southern Exposition at Louisville, Ky.; also at St. Louis, Mo., Kansas City, Mo.; Indianapolis, Ind.; Columbus, O.; Cincinnati, O.; Chicago, Ill.; and at each and all places where premiums were awarded the CHIEF carried off the first prize medal over all competitors.

And with the late new improvements added the CHIEF stands in perfection, at the head of human inventions.

The NEW IMPROVED CHIEF is wonderful in operation, is all steel and iron, and of the greatest strength and durability, is easily operated, and with two horses or a small engine makes 60 to 100 perfect bricks per minute. Grinds, tempers and at the same time moulds into brick any clay. Stones in clay cannot break it, nor interfere with its free operation. It is easily transported, and changed from horse to steam power. It fills the moulds evenly and well until the machine is empty of clay, pressing each brick equally and solid, so all will shrink alike. The pressure can quickly be changed while the machine is running to suit the consistency of the clay. All shafts are of steel; main shaft runs in three boxes or bearings all outside of the machine into which mud or sand cannot penetrate. The wear can at all times be taken up so as to prevent leakage. The clay in the press box is under full control of the plunger, which is direct and positive, and prevents the mud from floating back into the mud drum; this feature is not found in any other mud machine.

Bricks made by the NEW IMPROVED CHIEF, are solid and perfect, and have sharp edges and corners, and do not crumble in burning.



The NEW IMPROVED CHIEF is equally suitable either for small or large yards, the best of bricks are made by it at the least labor and expense, all parts are easy of access and the bearings can be oiled from the outside. All ordinary sizes of brick as well as ornamental brick can be made on the NEW IMPROVED CHIEF and it is especially adapted to making fire brick of any shape with the least danger of breakage and the smallest per cent of lost brick.

The NEW IMPROVED CHIEF is sold on its merits, and warranted to be all that is claimed for it.

We will send Circulars and Testimonials of the NEW IMPROVED CHIEF BRICK MACHINE, New Departure Tile Machine, Engines, Etc., Etc., free to any address on application. Address

Anderson Foundry & Machine Works,

[Mention the Clay-Worker.

Anderson, Indiana.

STEDMAN'S IMPROVED

Disintegrator and Pulverizer.

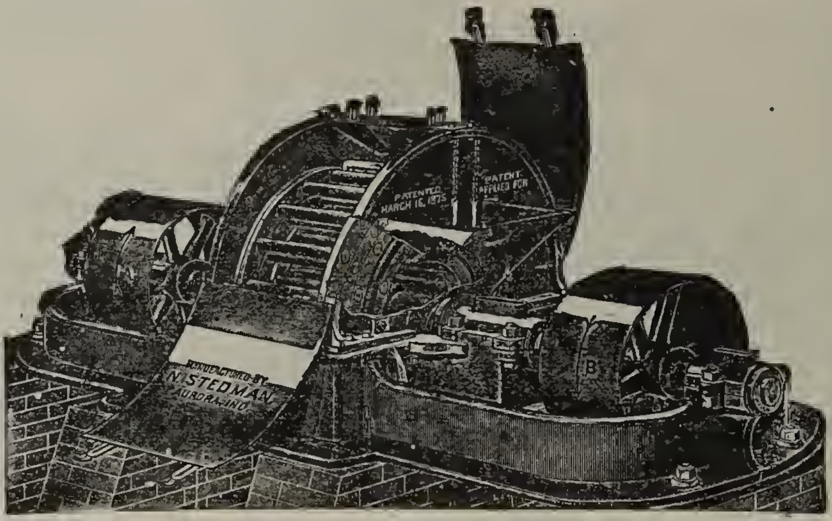
This mill will disintegrate or pulverize the following materials:

Clays of all kinds, Shale and Slate direct from the bank, for Brick and Tile.

Fire Clay and Sand Stone Rock—for Cement and Fire Brick.

Iron Ores of various kinds, Guano, Phosphates, Bones—green, dry steamed, Tankage, Bone-Ash, Salt Cake, Soda, Cracklings, Oyster Shells, Animal Matter in almost all conditions, Old Fire Brick and Tiles.

Old Pottery Ware, Plastic Clay, Asbestos, and in fact almost any material that can be disintegrated.



A good Disintegrator and Pulverizer is a long felt want in many branches of business. This Mill is an improvement over any yet made and is the result of practical experience.

This Mill is made in three sizes: 34, 40 and 48 inches. The capacity for clay is as follows:

34 inch Mill will pulverize for from 15,000 to 25,000 brick per day.
40 inch Mill will pulverize for from 20,000 to 35,000 brick per day.
48 inch Mill will pulverize for from 75,000 to 100,000 brick per day.

To Brick, Tile and Pottery Men and to Terra Cotta Works this Mill Is invaluable. It reduces the clay to a fine, light and soft condition, with its full adhesive properties retained.

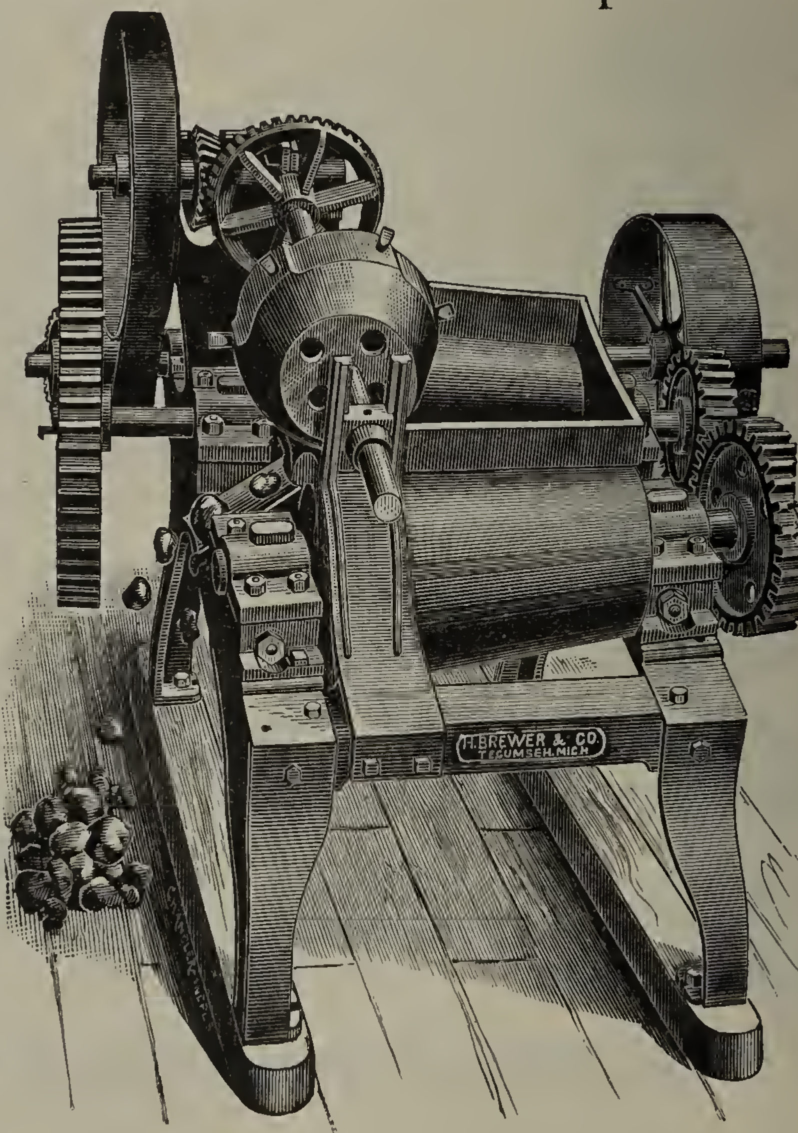
For Prices and any other Information, Address

Stedman's Foundry and Machine Works,

PROTECTED BY PATENTS. AURORA, IND.
[Mention the Clay-Worker.]

H. Brewer & Co's. Clay Crusher and Stone Separator.

The prominent feature in this Crusher is the combination of two smooth, tapering crushing rolls, running at different speeds, in connection with an adjustable transverse roll which is of irregular form and provided with teeth or spurs, whereby the clay is rapidly broken up and crushed, and the stones separated therefrom.


H. BREWER & CO. TECUMSEH, MICH.

TESTIMONIALS.

Saunemin, Ills., May 18th, 1888.
H. Brewer & Co., Gentlemen—Your Crusher works to a charm and we are very highly pleased with it. It runs one-half easier than any other Crusher we have had.
Yours Truly,
SAUNEMIN BRICK AND TILE CO.

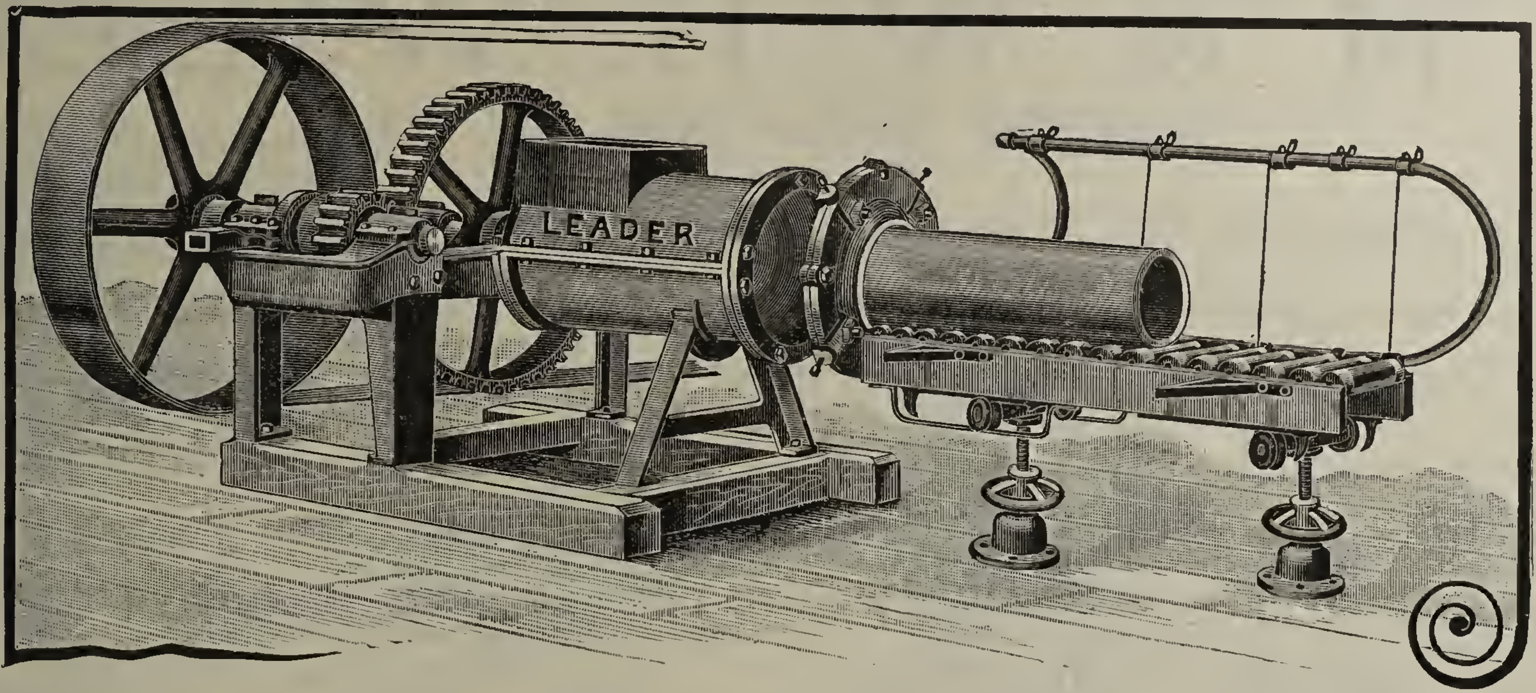
Budd, Ills., May 3d, 1888.
H. Brewer & Co., Dear Sirs—The Crusher and Elevator work to my entire satisfaction. I feel confident I would be $2,000 ahead, to-day, had I put in your Machine and Crusher at the start.
Yours Truly,
HENRY SIEDENTOP.

Monroe, Iowa, May 15th, 1888.
H. Brewer & Co., Gentlemen—The Crusher is giving good satisfaction and I think will do all that is claimed for it.
Yours,
T. P. BURCHINAL.

☞ Do not fail to obtain our prices on Tile Machines, Brick Machines, Pug Mills, Clay Crushers, etc. For illustrated Catalogues and Price List, address

H. BREWER & CO.,
(Mention Clay-Worker.) **Tecumseh, Mich.**

THE LEADER BRICK AND TILE MACHINE.



We manufacture the very latest and best designs of Tile Machines, Brick Machines, Clay Crushers, Elevators, and Dump Cars for handling clay by steam. Design special clay-working machinery to order. Have a large stock of the best cutting wire. Correspondence solicited.

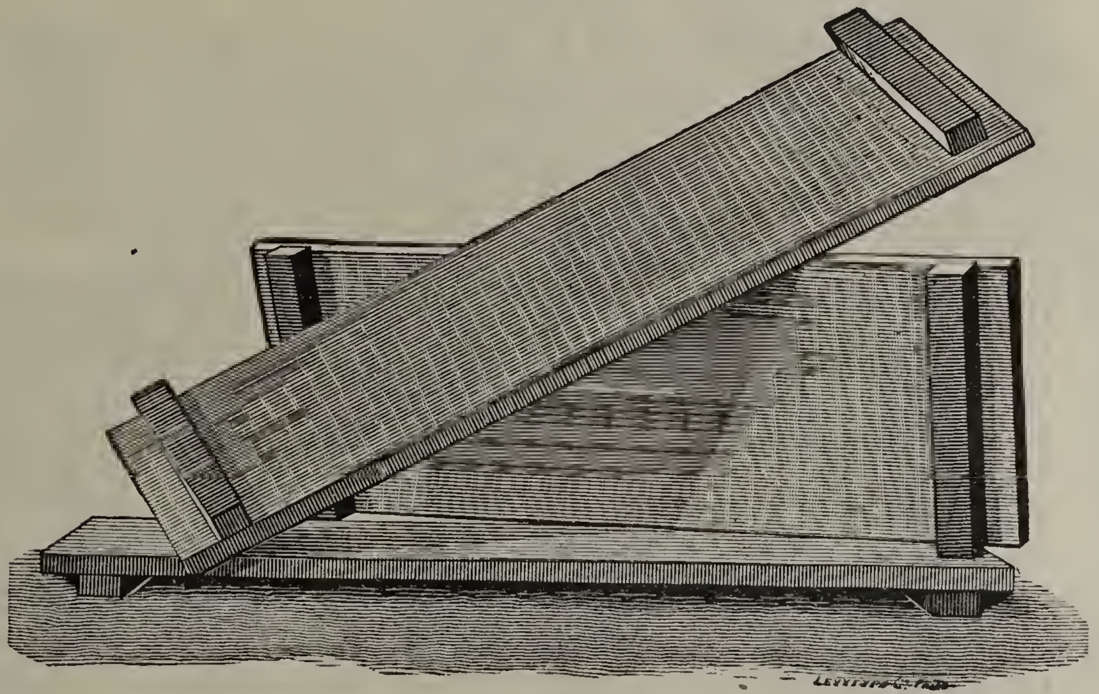
BROWN & HARROP MFG. CO.,

Geo. S. Pollock, Agent, Sullivan Ind

PORTLAND, IND.

BRICK PALLETS.

Brick Pallets.



Brick Pallets.

PIPE BOARDS, ROOFING LUMBER Supplied Direct in Carload Lots.

When writing for prices, give an exact description of the kind of pallet wanted, as different pallets are in use in different sections of the country. State whether cleats are to be nailed on; also length, width and thickness of the pallet. We have a big trade in this line and can save you one profit. Write for prices.

W. B. MERSHON & CO.,

Manufacturers of all kinds of white pine lumber and packing boxes in shooks.

East Saginaw, Mich.

THE STANDARD BRICK MACHINES

—MANUFACTURED BY—

A. M. & W. H. WILES,

Grassy Point, Rockland County, New York.

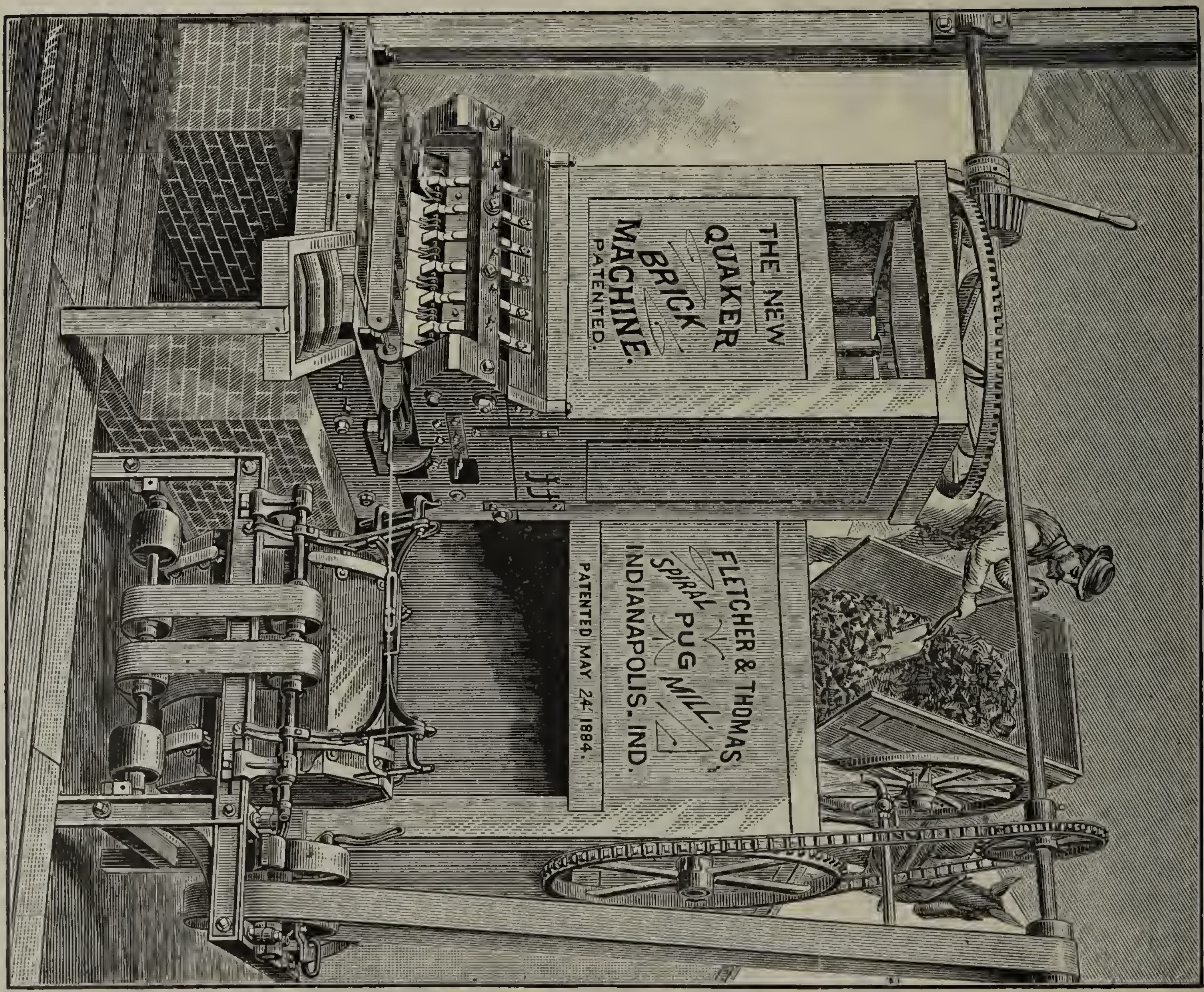
These Moulding Machines have been in constant use for over 30 years, and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

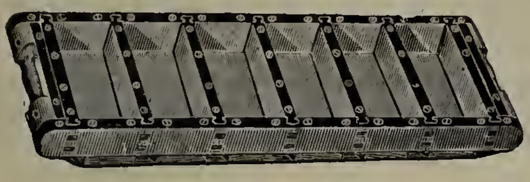
CORRESPONDENCE SOLICITED.


THE NEW QUAKER BRICK MACHINE. PATENTED.
FLETCHER & THOMAS, SPIRAL PUG MILL INDIANAPOLIS, IND.
PATENTED MAY 24 1884.

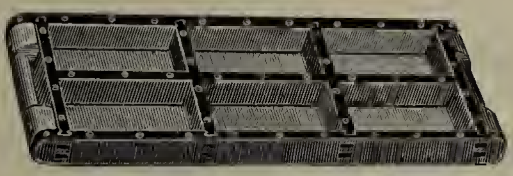
This outfit will make the largest number of the very best of Pallet Bricks at LeastCost of anything in the market. For further particulars address

BENNETT BROS. & CO., Wellington, Lorain Co., Ohio.

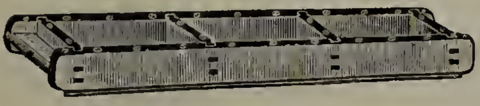
6 B. MACHINE MOULD.



6 B. HAND MOULD.



3 B. HAND MOULD.



D. J. C. ARNOLD,

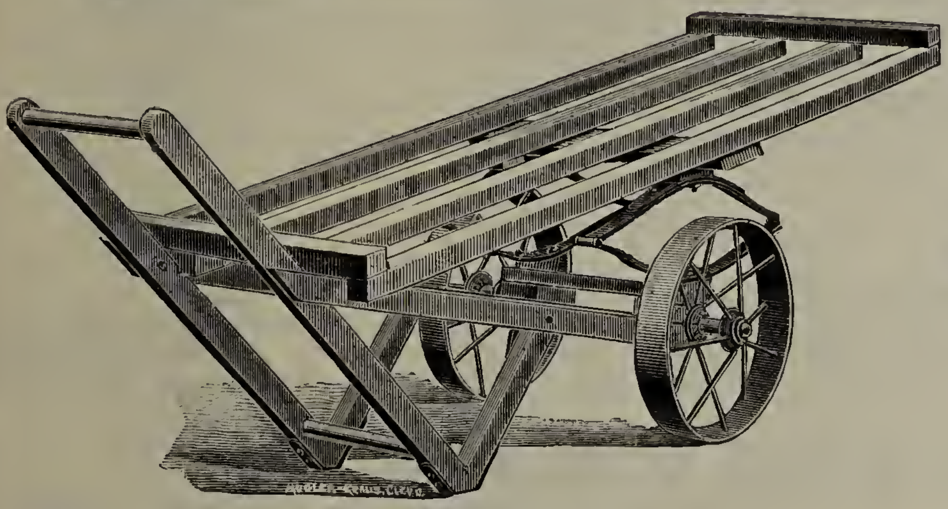
MAKES ∴ BRICK ∴ YARD ∴ SUPPLES

At NEW LONDON, OHIO.

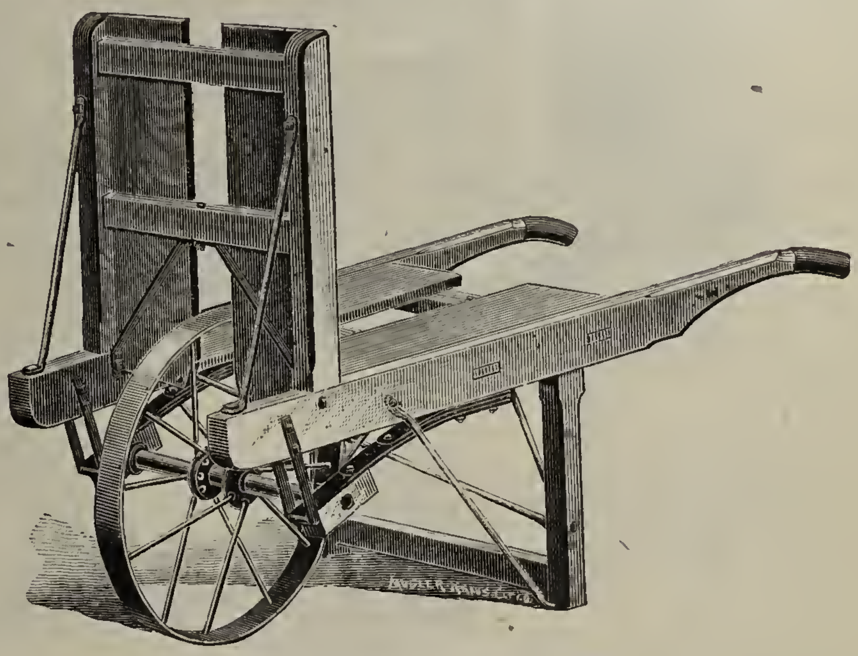
Get his prices before you buy. **All goods first-class in every respect.**

[Mention the Clay-Worker.]

☞Catalogue sent on application.



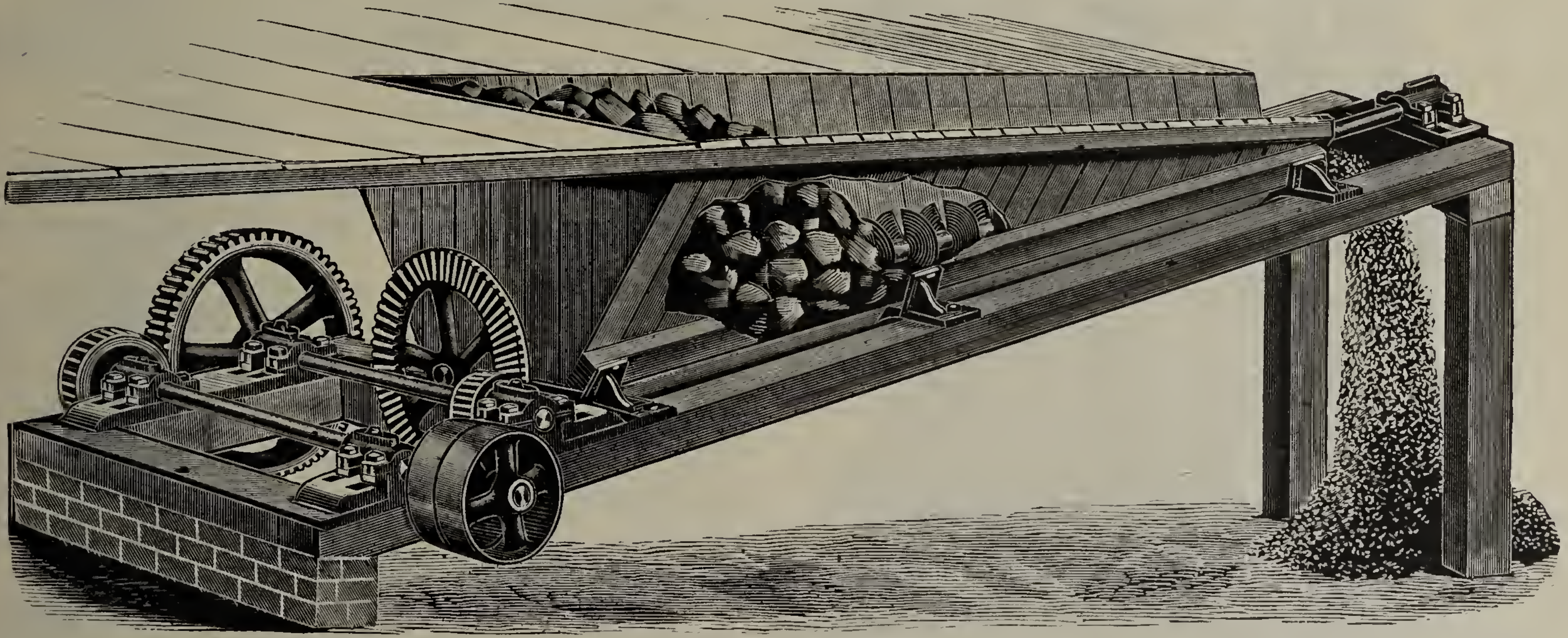
NO. 10 SPRING TRUCK.
(Weight 100 pounds.)



NO. 1 BRICK BARROW.
(Weight with springs 100 lbs.)

Emen's Patent Perfection Clay Granulator and Feeder.

SOLD SUBJECT TO TRIAL AND APPROVAL.



Saves time and labor and produces better ware; simple in construction; rapid and accurate in operation. Every brick, tile and sewer pipe manufacturer should investigate the merits of this machine.

During the past season it was introduced in several of the leading Chicago brickyards and is now at work giving entire satisfaction. Write for descriptive circulars.

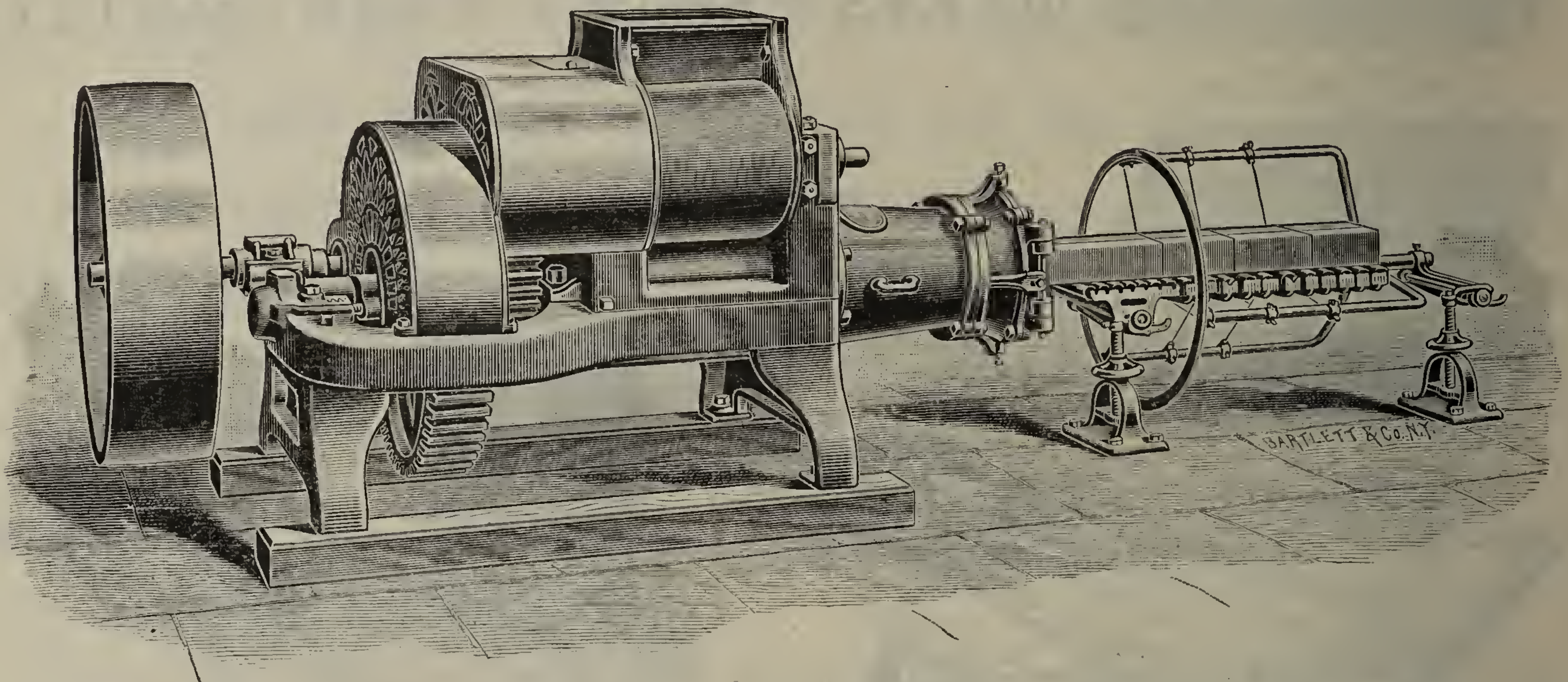
Chambers Brothers Company, of Philadelphia, Pa., are licensed to manufacture and sell these machines.

EMENS AND COLE

[Mention Clay-Worker.] HOLTON, (MUSKEGON CO.) MICH.

THE OHIO BRICK AND TILE MACHINES.

Now Built in Three Sizes to Meet the Requirements of Different Manufacturers.


BARTLETT & Co. N.Y.

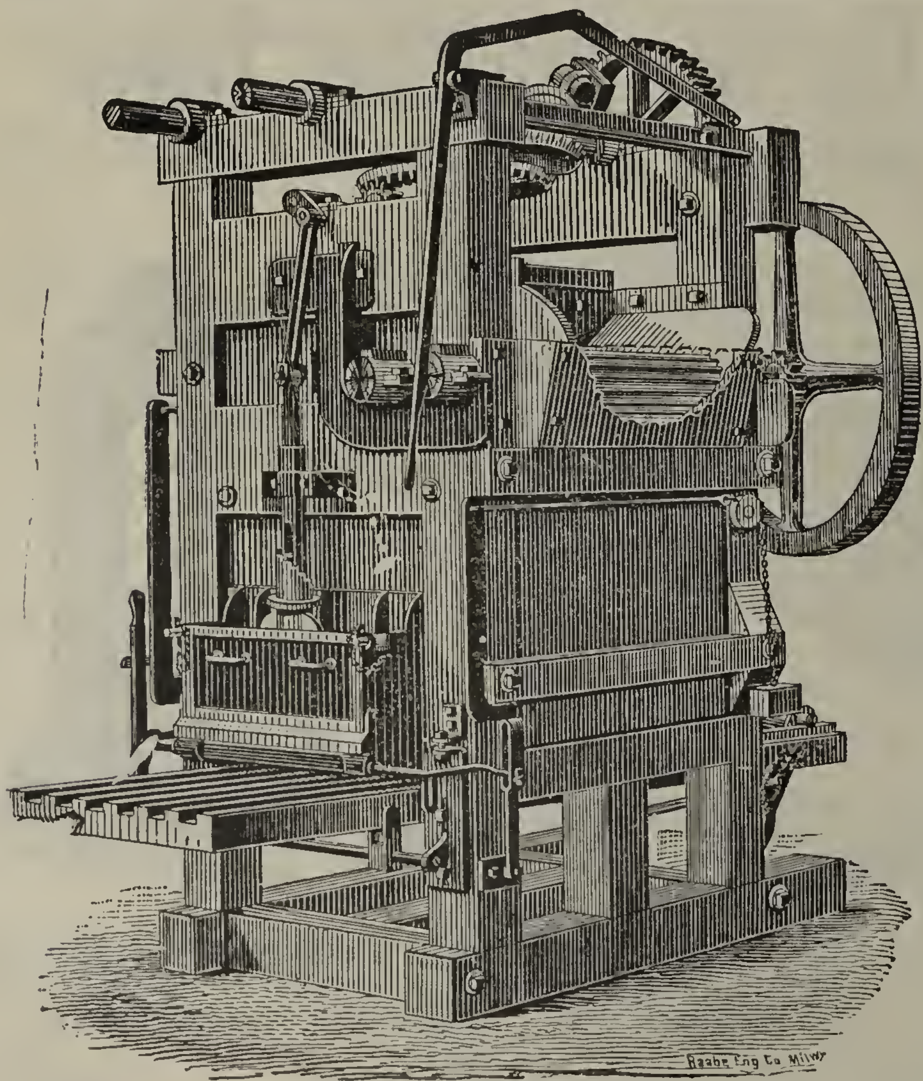
"B" or Medium Size Machine.

Clay Crusher combined with each machine. The A and B sizes of new design, and built with special reference to strength and durability, the heaviest strains being received on wrought iron bars instead of castings. Either size makes end or side-cut brick and tile up to 15 inches. Lubricating brick dies. Cutting tables for both brick and tile superior to all others. Satisfaction guaranteed.

☞For Catalogue and particulars, address

FATE & FREESE,

[Mention this paper. PLYMOUTH, Richland County, OHIO.



GURNEY
BRICK MACHINE WORKS,

MILWAUKEE, WISCONSIN,

Manufacturers of

THE GURNEY BRICK MACHINE

—Having Crushers Inside of Pug Mill.—

THIS is the only Machine in use which has the *combination of Crushers, Mixing and Moulding Apparatus* in a single machine. The arrangement is covered by patent issued October 6, 1885.

This machine will work any clay, however hard and lumpy, with no preparation before soaking in the usual way. The Crushers will take the clay through as fast as the machine will turn out the brick, *doing entirely away with lumps*, which brickmakers know have been much in the way of making good brick, and also have caused great loss by breakage.

The Machine will turn out four thousand, or more, good, smooth, square brick an hour. With proper moulding sand THE BRICK FROM THIS MACHINE, *made from any clay*, WILL SLIP EASILY. The Machine has been thoroughly tried in different parts of the country.

Also First-Class STEAM and HORSE-POWER MACHINES of same pattern, without Crushers.

For further information and Illustrated Catalogue address—

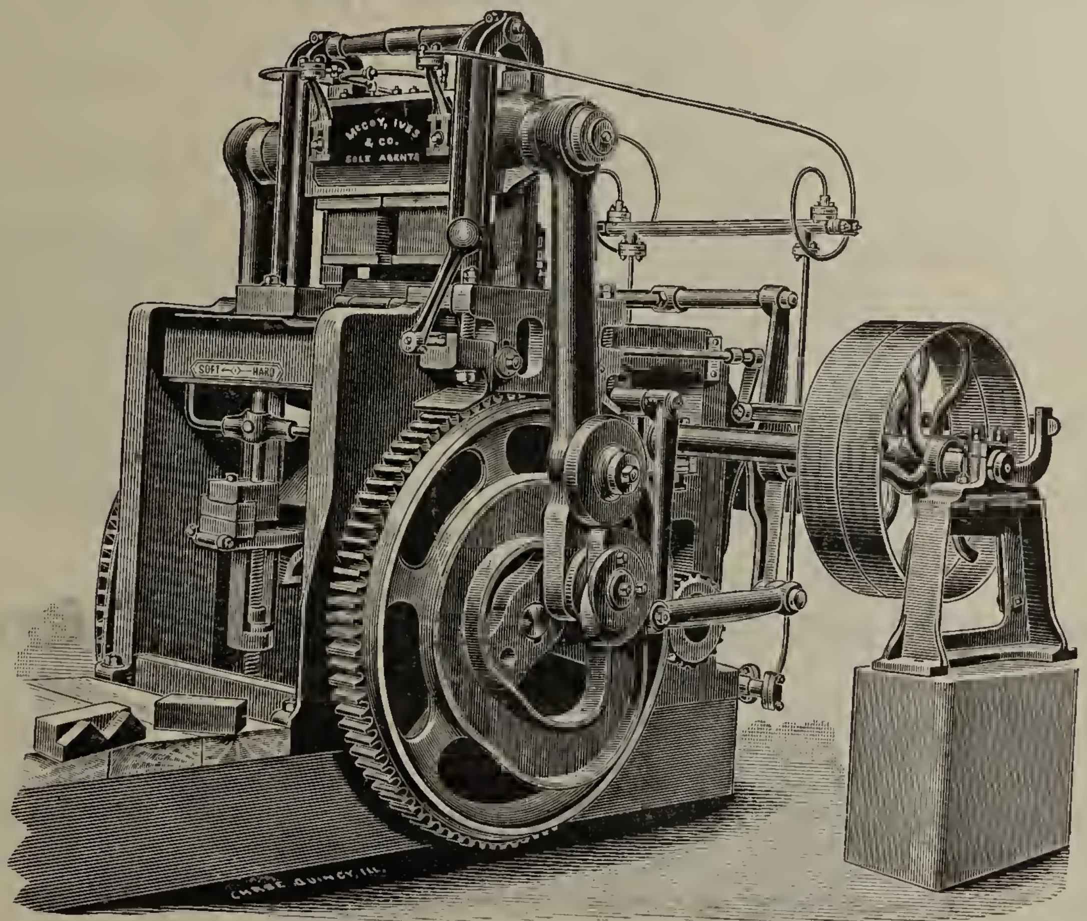
T. C. GURNEY,

100 Wisconsin St., MILWAUKEE, WIS.

WHITTAKER'S CELEBRATED
SEMI-DRY BRICK MACHINE

[Patented in U. S. May 13, 1884.]

THE BEST ON EARTH.

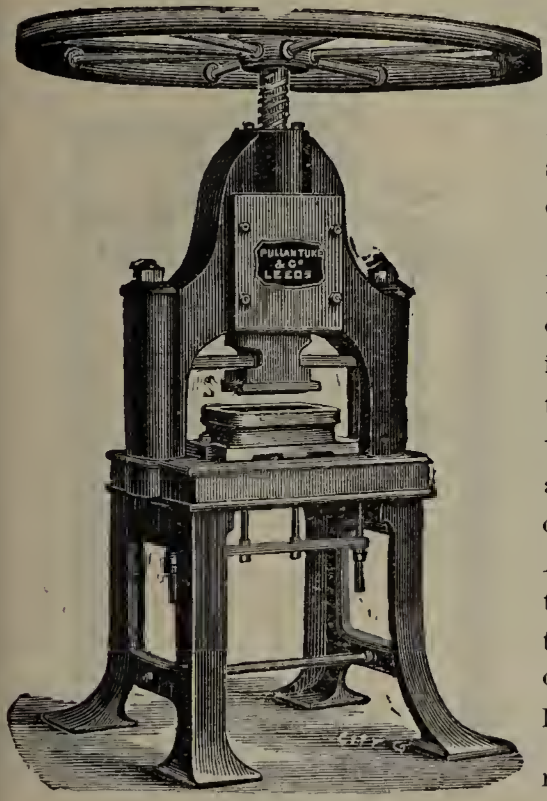


THE BEST ON EARTH.

For Circulars and other information address **McCOY, IVES & CO., Quincy, Ills.**

Titlev's Patent Screw Press.

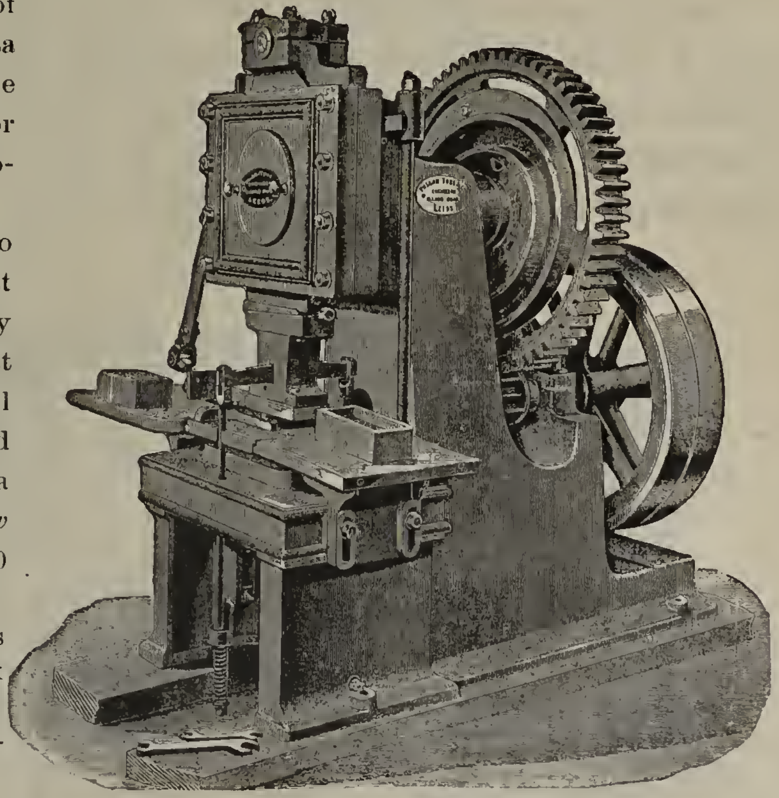
Pullan, Tuke & Gill's Patent Steam Press



We beg to call the attention of Brick, Tile and Terra Cotta Makers to these two Presses as the *Peers of any press on the market* for superiority of finish in the work produced.

The *Steam Press* is best adapted to large works and will produce the best quality of Front Bricks. Its capacity is 10,000 per day of the finest bricks at the smallest cost for labor. For small works and for all makers of moulded and ornamental bricks, tiles and terra cotta, we recommend the *Screw Press*. It will exert a pressure of 30 tons and is to-day *without a rival* the *best press on the market.* Its capacity is 3,000 to 4,000 plain brick per day.

Send for circulars giving all information, with testimonials.



ALFRED CROSSLEY,

Sole Agent for the United States. **Ironton, Ohio**

(Mention the Clay-Worker.)

ATTENTION, TILE-MAKERS.

Such improvements have lately been made in the production of Porous Earthenwares that the power and facilities usually afforded by the common drain tile manufactory will enable a manufacturer to step into a new and profitable business, protected from competition, at an outlay not exceeding that already invested in his plant, by more than One Thousand Dollars.

Shop rights or Territorial rights upon a royalty basis supplied by

The International Terra-Cotta Lumber Co.,

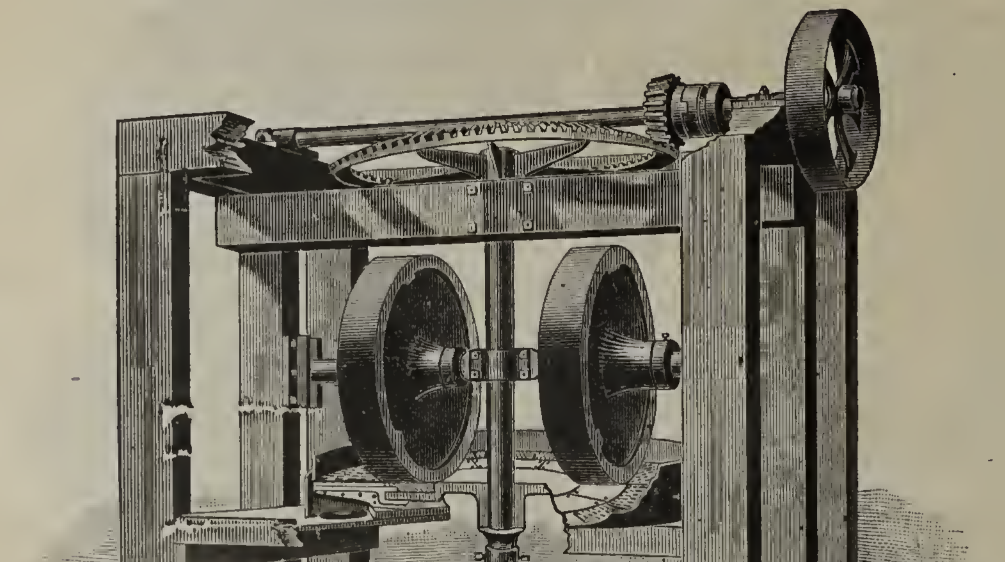
115 DEARBORN STREET, CHICAGO, LLS.,

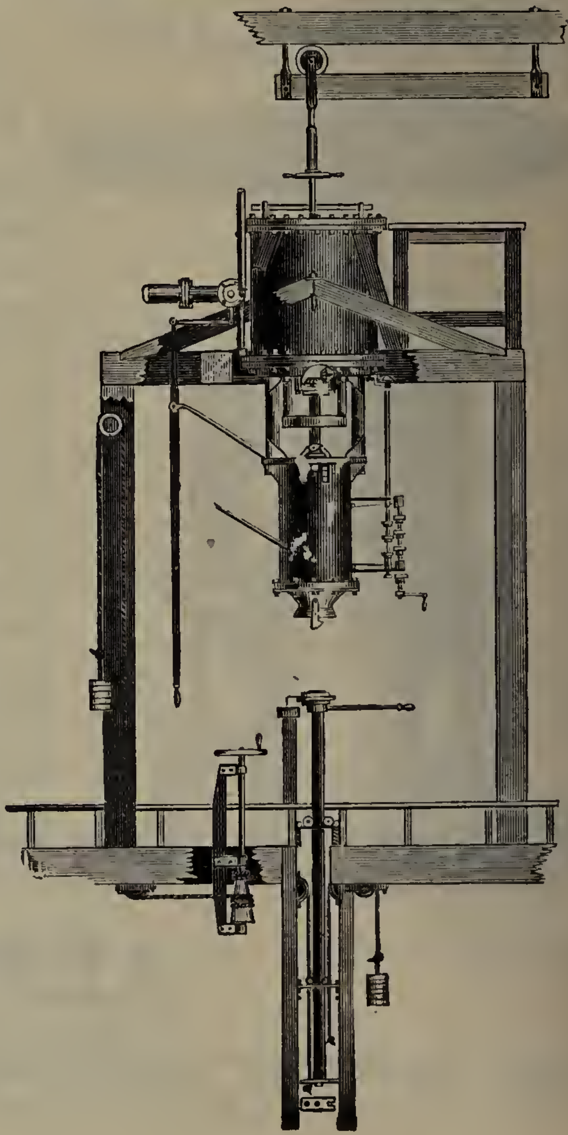
to whom all applications and correspondence should be addressed.

TAPLIN, RICE & CO.,

AKRON, O.

Manufacturers of Improved Clay Working Machinery of all kinds, such as Clay Mills, Dry and Wet Pans, the Barber Steam Sewer Pipe Press, Dies, Clay Blockers, Potters' Wheels and machinery of every description. Write for circulars.

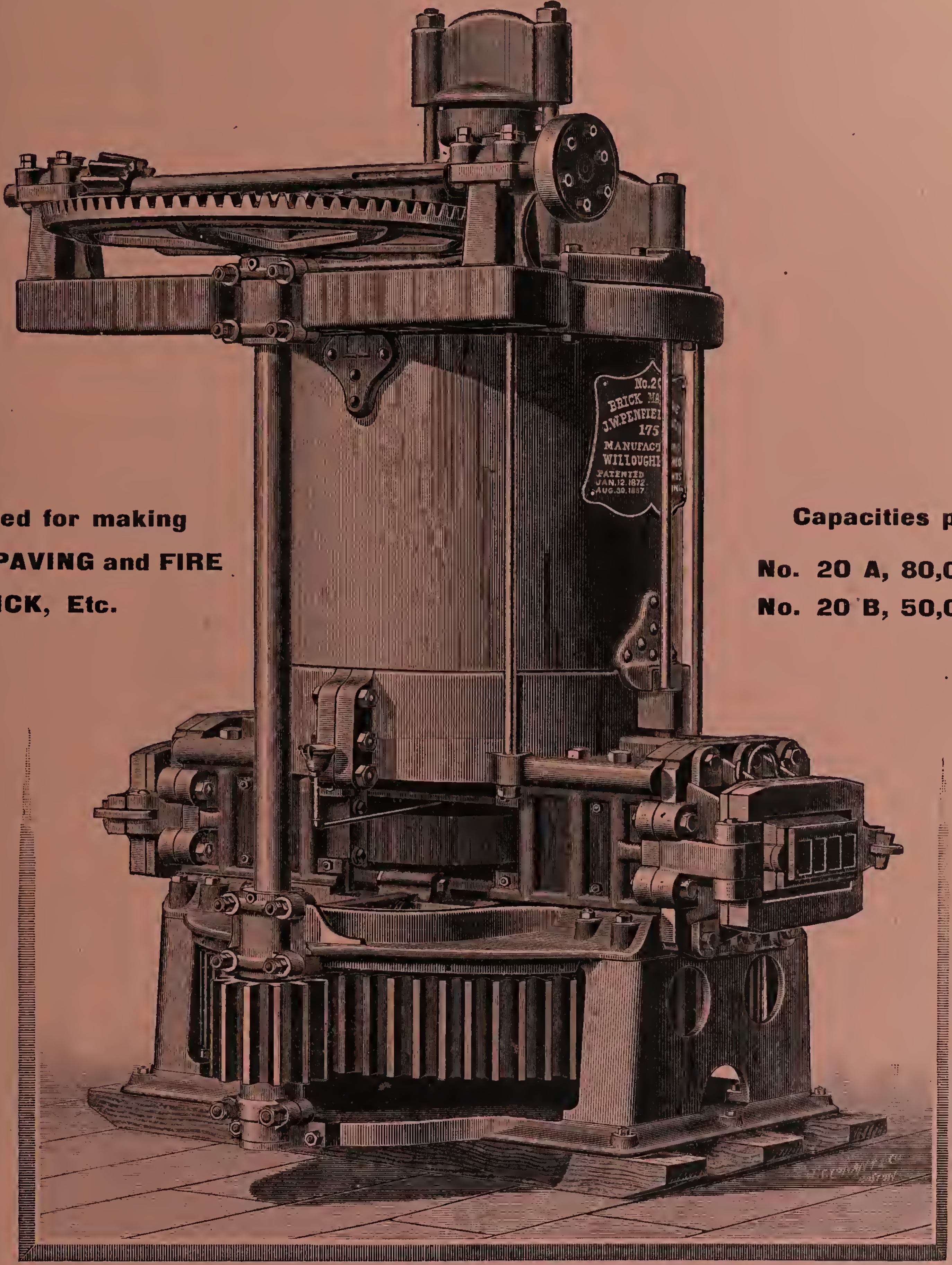




THE PENFIELD BRICK MACHINES

No. 20, A. & B.

The :: Largest, :: Strongest, :: and :: Best :: Brick :: Machines :: Made.



Unexcelled for making
COMMON, PAVING and FIRE
BRICK, Etc.

Capacities per day:

No. 20 A, 80,000 Brick.
No. 20 B, 50,000 Brick.

—WE MANUFACTURE—

Brick Machines; Tile Machines; Pug Mills; Clay Crushers and Stone Separators; Granulators; Elevators; Kiln Castings; Yard Supplies. Pulleys, Shafting, Hangers, Couplings, Etc., Etc.

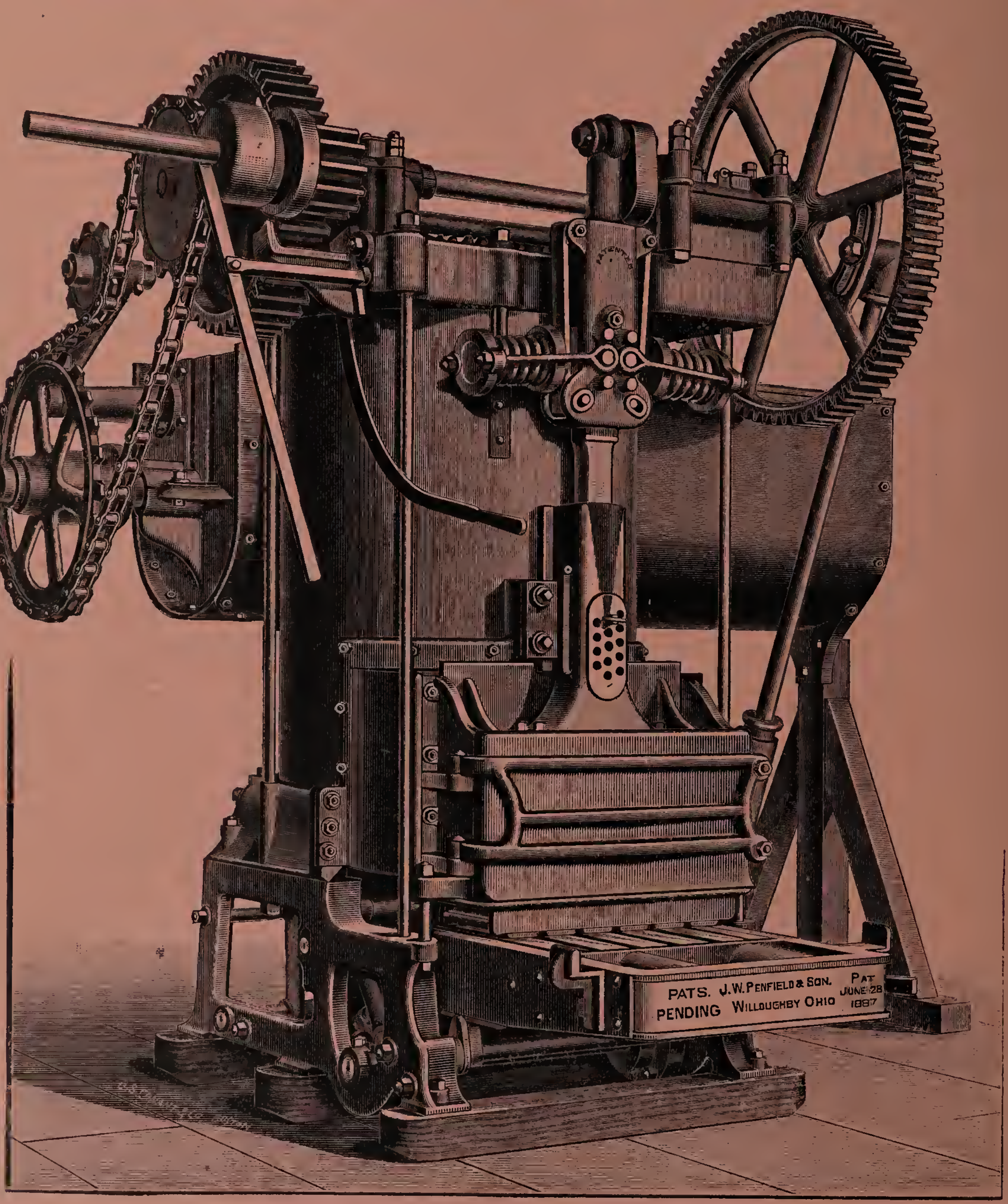
☞ *Complete Outfits* of any desired capacity a specialty. For full particulars address the manufacturers,

J. W. PENFIELD & SON, - - Willoughby, Ohio, U. S. A.

THE PENFIELD
Upright Stock Brick Machine.

WITH DIRECT-ATTACHED PUG MILL.

Every Brickmaker should send for full particulars of this machine.



This Machine is furnished with or without pug mill, as desired.

The Strongest, Most Practical and BEST Sand Moulding Machine made.

All Iron and Steel; No wooden parts to decay; Extremely heavy; Perfectly rigid; Light running; Has separate gearing for doing the pressing and pugging; Makes **six** of the largest sized brick in each mould.

All the brick are perfect in shape, with good sharp corners, in fact **perfect stock brick.**

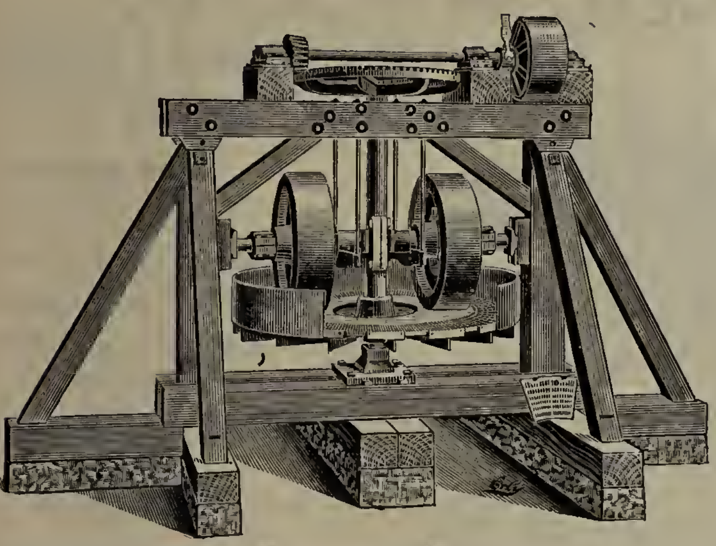
All the brick are of equal density, and if repressed will make first-class pressed brick, **ALL UNIFORM IN SIZE.** Address the Manufacturers,

J. W. PENFIELD & SON,

[Mention the Clay-Worker.]

WILLOUGHBY, OHIO. U. S. A.

THE FROST
Dry & Wet-Pan Crushers, Chasers, Etc.,



—FOR—

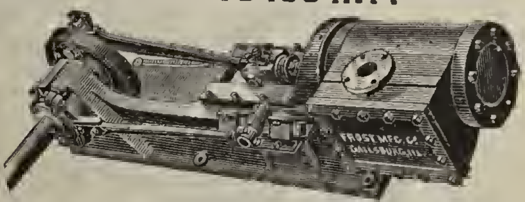
**BRICK, TERRA-COTTA,
SEWER PIPE AND
FIRE CLAY.**

—o—

The best and cheapest machines made for working hard clay, soap stone, grog, etc.

Write for prices and other information.

THE FROST ENGINE Co.
GALESBURG, ILL.
ALL SIZES UP TO 150 H.P.



ELEVATOR SUPPLIES
PULLEYS, SHAFTING, SPROCKETS, BUCKETS, BELTING, SHELLERS, CLEANERS, MILLS, &c.
SEND FOR CATALOGUES

ESTABLISHED 1812,
AND CONTINUED ON THE SAME PREMISES EVER SINCE.

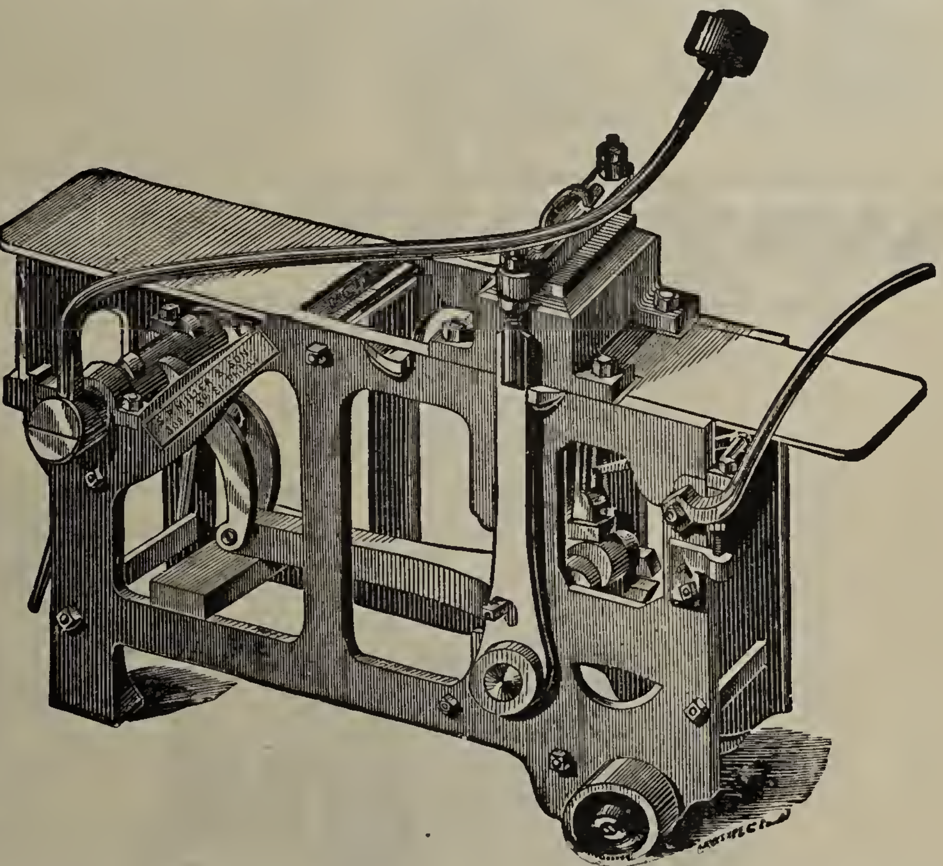
MILLER'S
BRICK PRESSES,
Introduced 1844 Latest Improved Patents, Aug. 28, 1883.

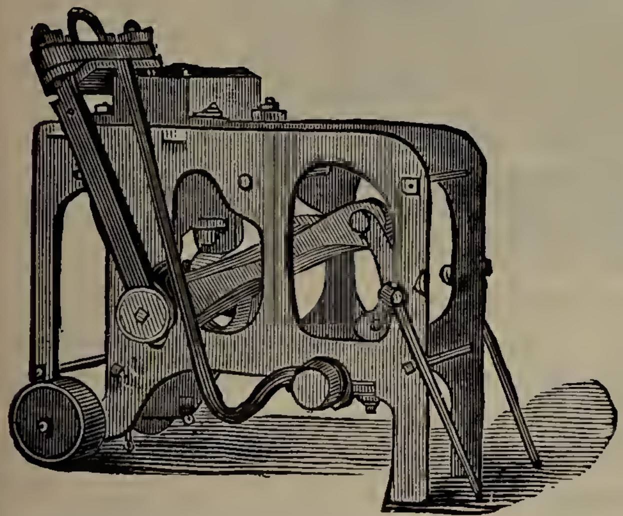
SAMUEL P. MILLER & SON,
MAUFACTURERS OF
RED AND FIRE BRICK PRESSES,
Of five different styles, embodying all the improvements in Hand Brick Presses in use.

Clay Wheels with Reciprocating Rack, Kiln Castings, Brick Moulds, Clay Spades, and the Tools in General Use for Brick Making.

No. 309 SOUTH FIFTH ST., PHILADELPHIA, PA.

S. P. M. & Son refer to Brickmakers generally. ☞ Orders from abroad promptly attended to



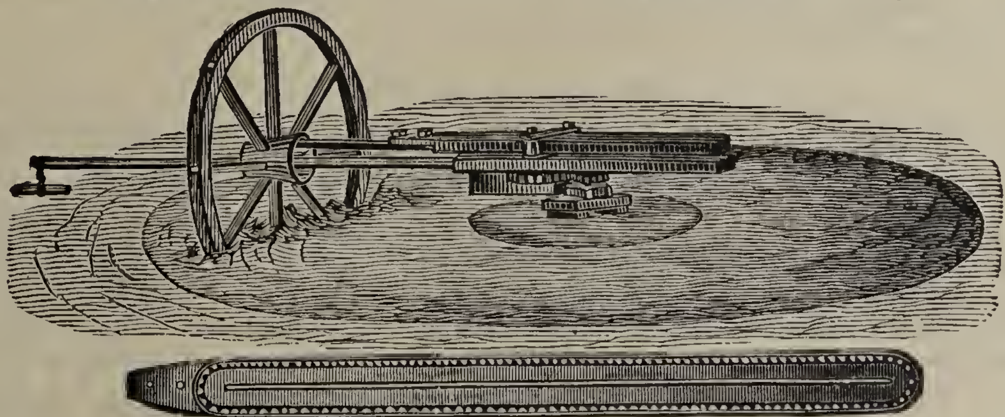


RED BRICK PRESS.

GEORGE CARNELL,
Nos. 1819 and 1821 Germantown Avenue,
and Fifth St.,
PHILADELPHIA, PA.

☞ Send for Circular and Price-List.

Philadelphia Brick Machine Works
—MANUFACTURER OF—
FIRE AND RED BRICK PRESSES.
Various sizes, from the smallest size up to 24 inches; also, manufacturer of **Clay Mills, Tempering Machinery,** and all kinds of **Brickmakers' Tools.**



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and is fitted up ten per cent. cheaper.

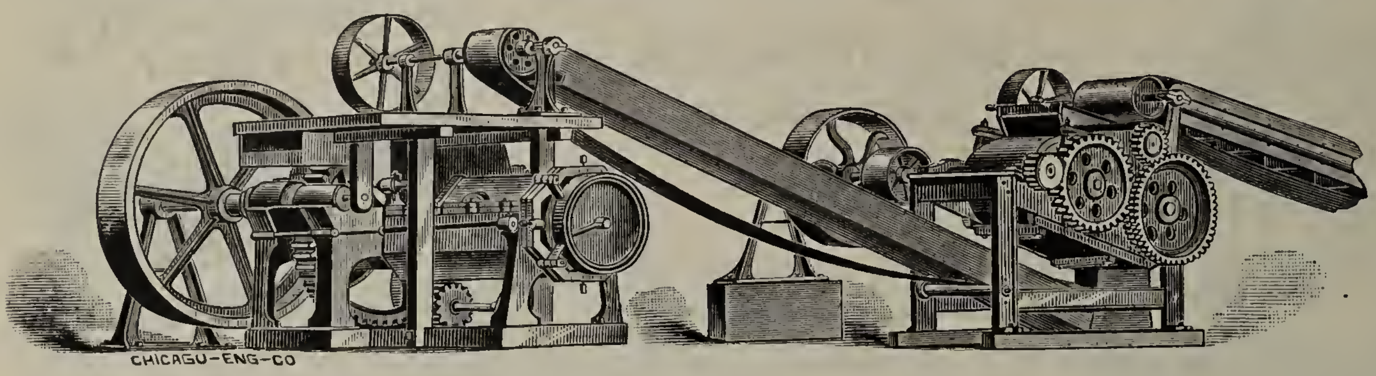
☞ Mention THE CLAY WORKER.

Adrian Brick and Tile Machine Co., Adrian, Mich.,

MANUFACTURERS OF

Brick and Tile Machinery,

Clay Crushers,
Engines
and boilers.



Also Daso's Builders' and Contractors' Elevators. Steam Fittings and Iron and Brass Castings Furnished to Order.

The working qualities of our machinery at its present state of development as estimated by one of the prominent Brick Manufacturing Companies of Kansas City, are stated in the following reply to a letter of inquiry addressed to them:

KANSAS CITY, MO., August 21, 1888.

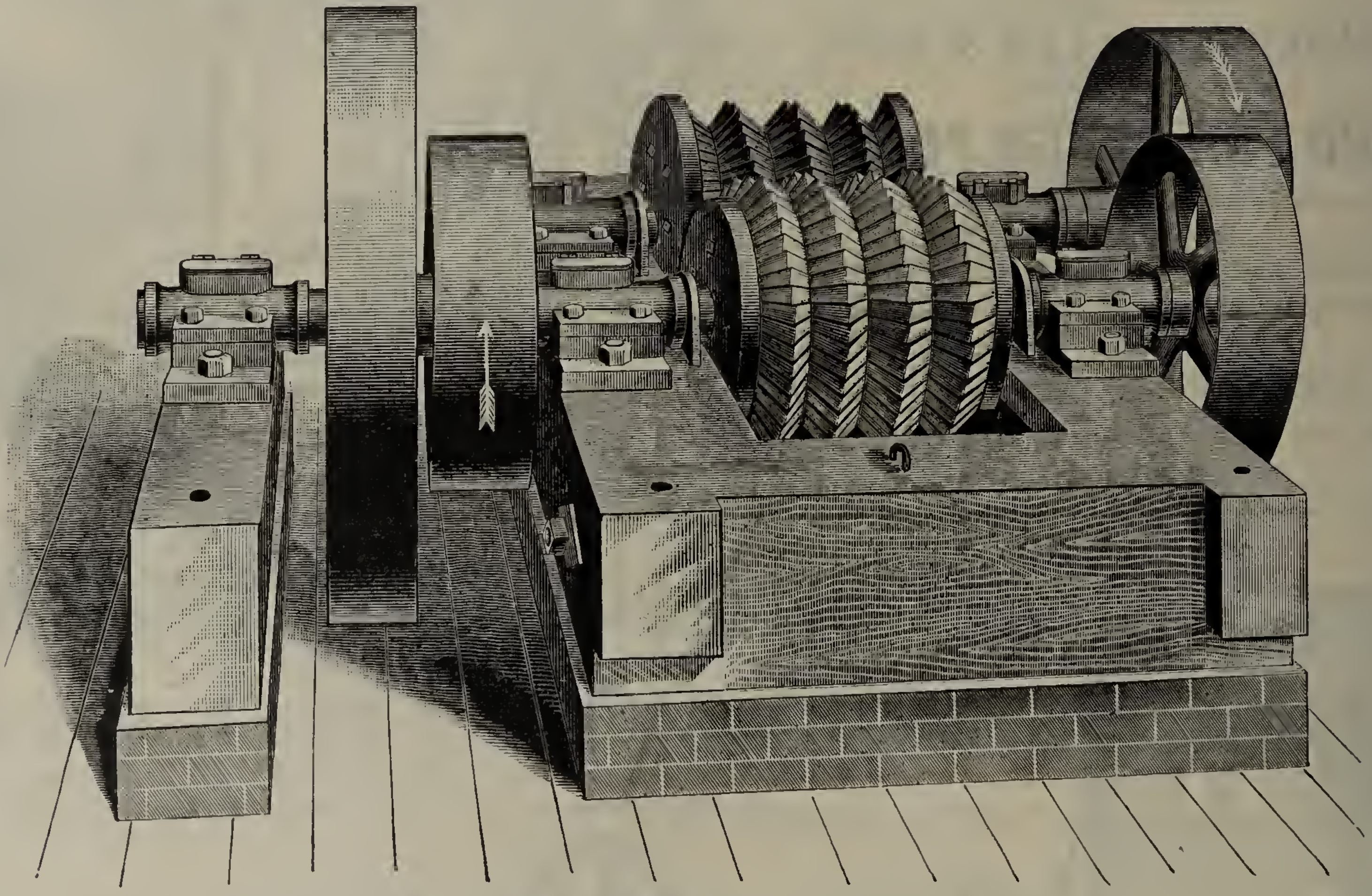
JOHN GIBSON, Esq., Monticello, Iowa:

DEAR SIR—In answer to your favor of the 16th will say, that we do not think there is any room for improvement in the Adrian Brick and Tile Machine Co's No. 4 Cut-off Table, as it cuts the brick as near perfect as possible, without tearing the edges; thus leaving the ends of the brick as perfect as the face. We are also using the new dies on both our machines, and are well pleased with them, as they are 100 per cent. better than the old style and turn out a perfect column of clay without warping or twisting. We have two No. 3 McKenzie machines and they are doing excellent work for us and we averaged during July, 26,800 brick, each, per day. In conclusion we will say that both the new tables and the new dies are so incomparably superior to the old ones that it gives us much pleasure to recommend them.

Very truly yours, SEDDON & EDWARDS BRICK CO.

NEWELL IMPROVED CLAY PULVERIZER

We Guarantee the Material and Workmanship and allow a Trial of our Machine to any Responsible Party.



NEW 19-INCH LETTER C PULVERIZER, WITH HOPPER REMOVED.

Heavy Cold Rolled Shafts running in best Anti-Friction Metal Bearings, protected from dirt.

A FEW OF OUR CUSTOMERS AND REFERENCES:

Henry Maurer & Son, (3 Pulverizers) 420 E. 23rd St., New York City.
Peerless Brick Co., Philadelphia, Penn.
Perth Amboy Terra Cotta Co., (2 Pulverizers) Perth Amboy, N. J.
Syracuse Pressed Brick Co., Syracuse, New York.
Potomac Terra Cotta Co., (2 Pulverizers) Washington, D. C.
Siner & Brother, Frankford, Penn.
W. H. Perot, Baltimore, Md.
The Rathbun Co., Deseronto, Ontario, Canada.
Murrill Dobbins, (3 Pulverizers) Philadelphia, Penn.
American Brick & Tile Company, Phillipsburg, New Jersey.

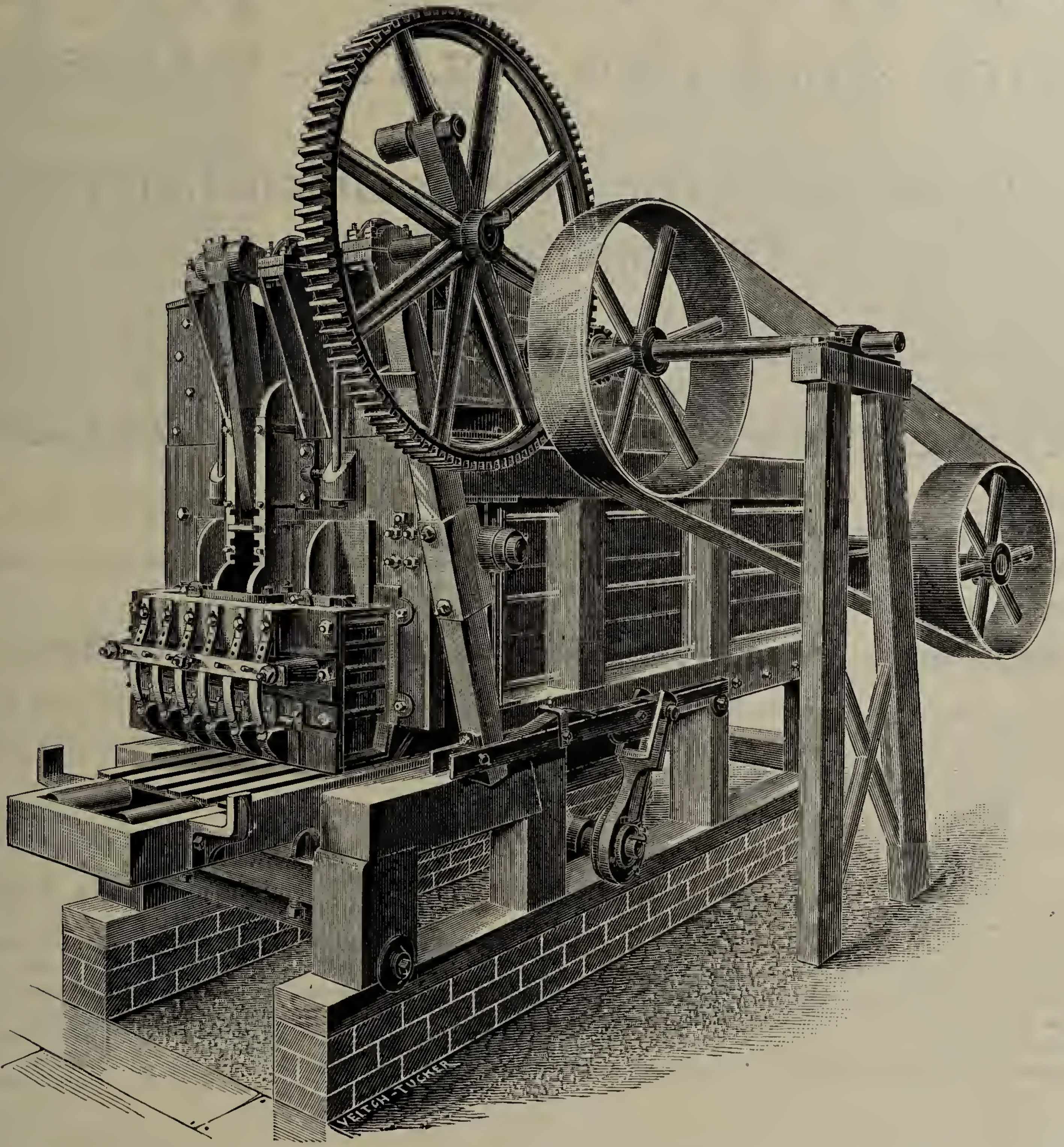
Send for Illustrated Circular and Price List.

NEWELL UNIVERSAL MILL CO., - 10 Bethune St., NEW YORK.

THE "NEW HAVEN"

HORIZONTAL STEAM POWER BRICK MACHINE.

WEIGHS 12,000 POUNDS.



SIMPLE, STRONG, DURABLE.

No Pug Mill Required.

HEAVIEST, MOST POWERFUL, and **BEST MACHINE** on the market for making sand moulded brick being carefully designed to secure the **Greatest Possible Production of First-Class Brick with the Least Outlay and Loss of Time to Repair Breakages.**

We have found Brickmakers (now using this machine) who think it wiser to buy a substantial Machine than waste time, exhaust patience and lose money with the many cheaply constructed machines with which the country is flooded; and we are positive there are many others who think the same way. If you are one of them write us and we will tell you all about it.

We believe our years of experience with Brick Machine repairs and the advice of a practical Brickmaker has enabled us to produce a Machine Superior to all.

The McLagon Foundry Co.,

NEW HAVEN, CONN.

[Mention the Clay-Worker].

MORRISON'S
IMPROVED KILN

FOR -:- BURNING -:- CLAY -:- WARES

Especially adapted to Burning Common, Repressed and Ornamental Brick.

PATENTED IN UNITED STATES AND CANADA.

SUCCESSFUL! DURABLE!

Daily product of our Kilns in the United States, One-Half Million Bricks. Our claims fully substantiated BY OUR PATRONS. We claim ninety to ninety-five per cent. hard brick. Arch bricks all Fronts and Pavers and none damaged—of uniform color. Pressed brick burned without fire-marks—coal screenings preferred for fuel. One fireman for two hundred thousand bricks. The

Only Kiln That Regulates the Temperature of Heat

And directs its course by a system of air drafts, giving complete control of the degree of heat, as well as its manipulation. This system we have covered by letters patent. Any persons using these air drafts are liable to prosecution for infringement.

Read the following testimonial from a recent patron, and another new one from an old patron:

Knoxville, Tenn., October 31st, 1888.

R. B. Morrison, & Co., Rome, Ga.:

GENTLEMEN—I have used your *Improved Kilns* during the past twelve months and cheerfully report the result. We burn our bricks in your Kiln at a cost of sixty-five cents per thousand for fuel and labor; a saving to us, over our old method, of eighty cents per thousand on the two items. My saving in waste brick in the kiln and at the building is fully *ten per cent.*, or sixty cents per thousand in other words. Every time I burn your kiln of 300,000 bricks it is a saving to me of *more than four hundred dollars* over the old process. I find your kiln durable and simple to operate. We use coal screenings for fuel. Have no waste in arches, and burn ninety per cent. hard brick. I have no hesitation in pronouncing your kiln a success in every respect, as you make no claims it does not fulfill. Yours Truly,

REPS. JONES.

Atlanta, Ga., July 20th, 1888.

R. B. Morrison & Co., Rome, Ga.:

GENTLEMEN—We have used your Improved Kilns for three years and during that time have burned upward of a hundred millions in them and wish to emphasize our former statement in regard to your kilns. They are reliable, durable, and the best kilns for our purpose, we have been able to find after investigating many of the various kilns in use, and say to our friends of the trade: If you want kilns that will burn your brick nearly all hard. and do it every time, burn them economically and without loss, and with little cost for repairs, secure the Morrison Kiln. CHATTAHOOCHEE BRICK CO., per GEO. W. PARROT, Vice-Pres.

—WE SELL OUR KILN STRICTLY ON MERIT—

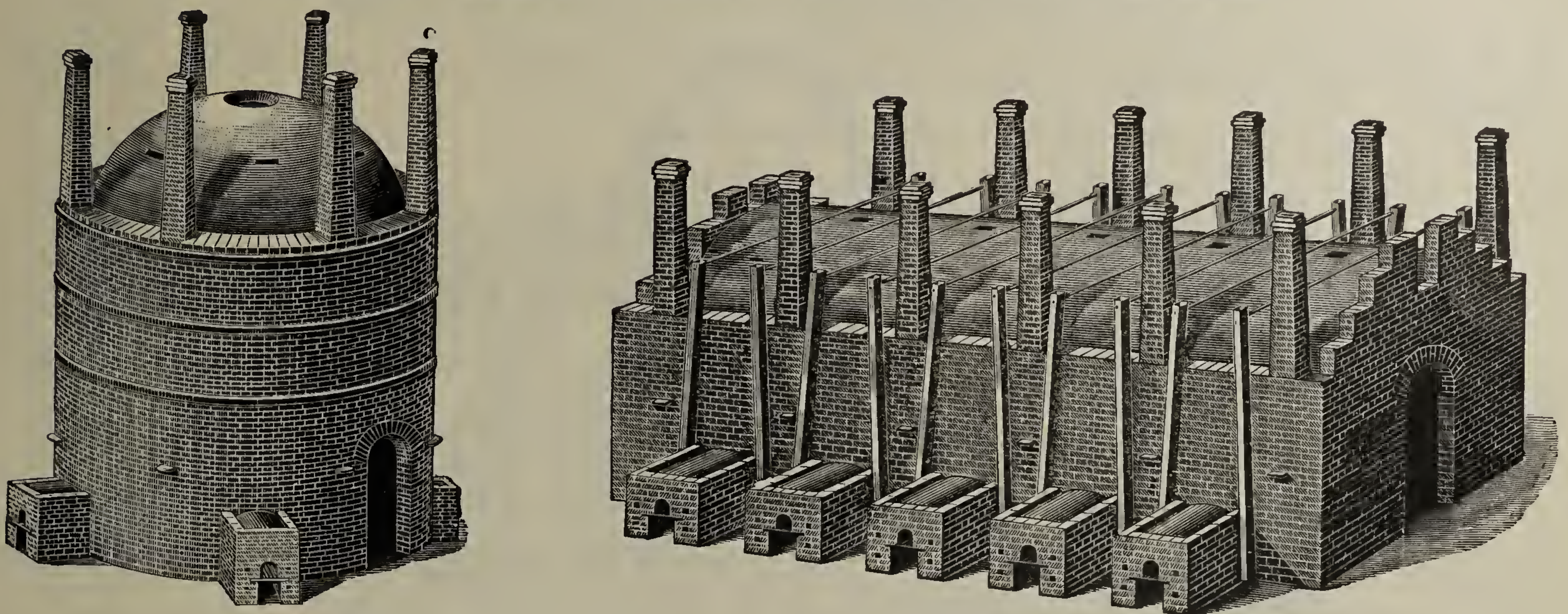
☞For descriptive circulars, additional testimonials, and all information desired, address

R. B. MORRISON & CO.,

Box 335, - - - - ROME, GEORGIA.

THE EUDALY KILN.

BURNS ANY KIND OF CLAY OR WARE.



THE DOWN-DRAFT KILN.

UNIFORMITY IN BURNING is without a doubt the most essential feature to clay workers. Especially is this the case with fine clays where it is desired to have the wares of uniform color, size and hardness.

In the construction of these kilns particular attention has been paid to this point, by having first carefully examined the subject of drafts and the strength and nature of the different kinds of fuel. The size of the kiln, the size and number of furnaces, flues and chimneys must always sustain the proper relation to each other for a perfect draft. Too much draft is as dangerous as too little. One of the greatest mistakes of kiln inventors and builders is that they utterly disregard the important subject of drafts.

ABILITY TO DIRECT THE HEAT TO ANY PART OF THE KILN is equally as important as a proper draft. Unless the burner has control of the heat in the kiln he has no assurance of a uniform burn. In these kilns if the burner finds the wares too hot in any portion of the kiln he can in a moment shift the heat to any other part where it is not so hot, or what is better, if he has two or more kinds of wares in the kiln, one of which requires more burning than another, he can easily give that portion of the kiln an extra amount of heat. We claim that this is the only kiln in which these results can be attained successfully.

For this reason wares can be burned by this system **more uniformly** than by any other.

Practically there is no difference from top to bottom, yet this is purely a *down draft* kiln. There are no inside dampers or cut-offs. **Everything about the kiln is permanently built.**

ECONOMY OF FUEL AND LABOR is perhaps the second most important feature of any kiln. We hear a great deal said about "economy in fuel and labor," but to understand what is necessary to a fuel and labor saving kiln one should be thoroughly acquainted with all kinds of fuel and the conditions necessary to get the greatest number of heat units out of it, and at the same time **distribute the heat to the burning wares in the most effective manner.**

We claim that our latest improved furnace is the most **complete economizer** of fuel that has ever been invented.

The construction is purely scientific, and is made by first obtaining the chemical requisites necessary to insure perfect combustion and then building a furnace to bring about these results. Different kinds of fuel require a different size and construction of furnace. We use any kind of fuel, soft coal, screenings, oil, gas or wood.

COST OF CONSTRUCTION.—These kilns require no large stack, which ordinarily costs as much as the kiln proper. Many persons think they must have a large, tall stack in order to have sufficient draft to get the bottom of the kiln burned.

This is certainly a mistaken notion.

The things that are required, however, are a correct location and size of furnaces, flues and chimneys with reference to each other and the kiln. When these are properly attained the burner need have no fear about draft.

In these kilns great care has been taken to adjust these relations in such a way that the expensive stack is not at all required, and a much better draft obtained.

DURABILITY.—Each part of these kilns is built with special reference to strength and durability.

The furnaces, which are perhaps the most perishable parts of any kiln, are in these kilns made very strong and durable.

Those parts most liable to burn out can be easily removed and replaced without damage to the other parts of the furnace.

Rules are given by which a builder of these kilns can get the strongest crown and best supports to the kiln.

SIZES.—These kilns can be built either **round** or **square,** and of **any** desired **size.** A number of these kilns are now in use that burn from **150** to **250** thousand bricks at a time. The walls are built **twenty-four inches thick.** They should be lined throughout with fire-brick where the clay is very hard to burn. Good kilns can be made, however, without using fire-brick for any part except the **furnaces** and **bags.** In asking for cost of construction **state size of kiln in feet wanted,** whether the kiln walls, crown or bottom are any or all to be lined with fire-brick.

DRAWINGS and specifications for building kilns will be furnished any who purchase *kiln or yard rights.* We usually can urnish a man to superintend the building if desired.

For further information address

W. A. EUDALY,

64 Johnston's Building, - - - - - CINCINNATI, OHIO.

SECURE THE BEST.

WE are making some valuable improvements on our Clay Disintegrators which are still on top and

DON'T YOU FORGET IT.

We will soon be prepared to show a cut of our Grand Automatic in its new dress—ALL IRON AND STEEL. It will pay you to defer any purchase in this line until you have seen the GREAT MOGUL.

The Grand Automatic Brick Machines and accessories now manufactured at Cincinnati, Ohio, are universally acknowledged the most reliable machinery of its class on Earth.

LAST AND BEST.

Our new Relief Pitman (patents pending and no infringement on Potts, either, savvy?) for plunging the clay into the moulds, releases itself at any desired pressure, insures ABSOLUTE safety against any breakage of the gears or parts of press-box from obstructions that may get under the plunger. This is no SPRING ARRANGEMENT, but the finest piece of mechanism ever placed upon a brick yard and will be fully illustrated in the SEPTEMBER NUMBER OF THE CLAY-WORKER. This device not only insures against breakage, but gives uniform pressure to each mould as this pitman is set accurately to as many thousand pounds pressure as is wanted and that much, and no more, pressure is exerted. The long felt want in making brick for repressing, insures perfect brick every time.

If you wish to secure the very best, most reliable and most practical Brick Machinery together with good, honest treatment, you should correspond with the Inventors and Manufacturers,

JONATHAN CREAGER'S SONS,

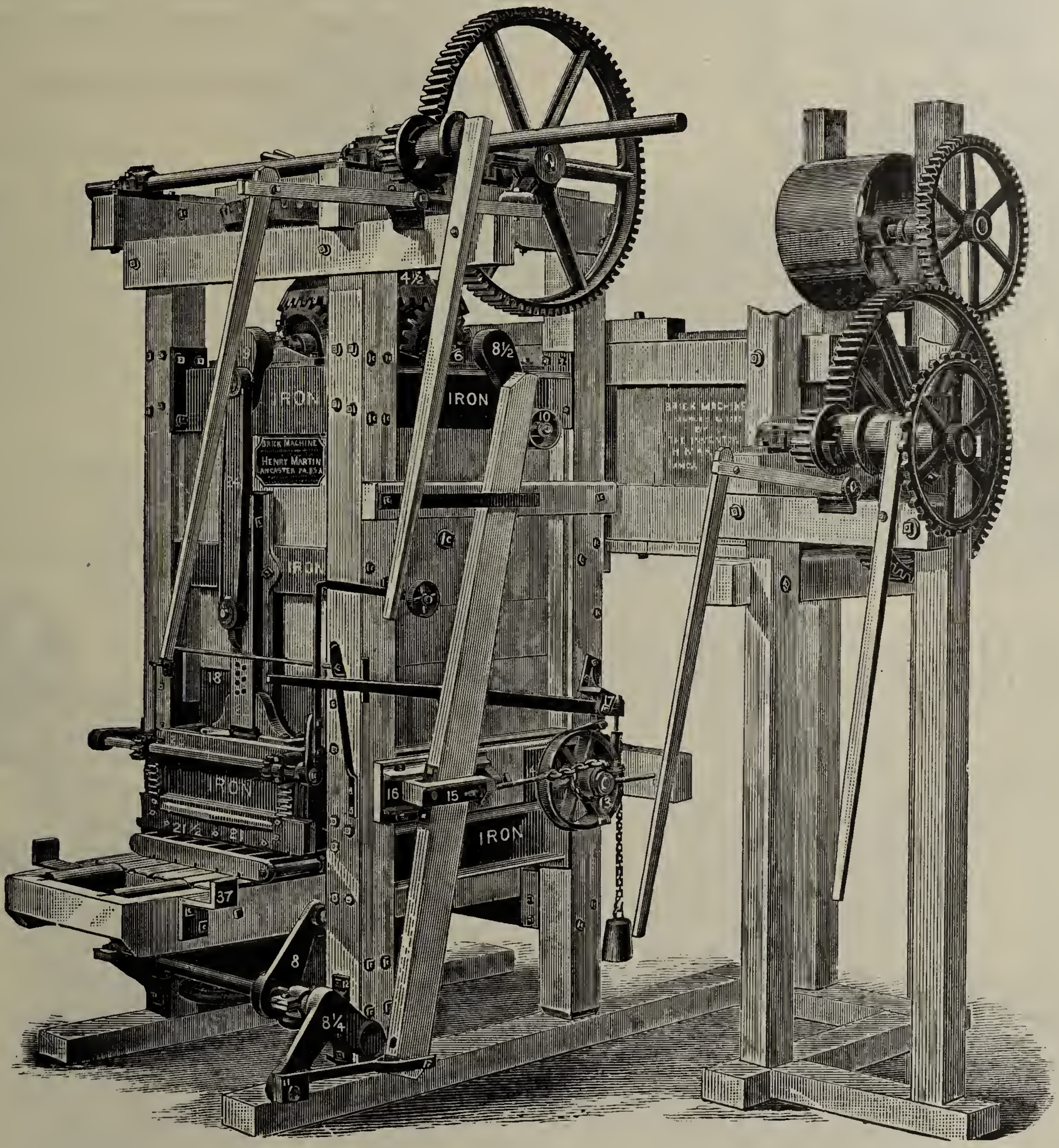
CINCINNATI, OHIO.

[Mention the Clay-Worker.]

The Henry Martin Brick Machine.

For Steam or Horse-Power.

WITH OR WITHOUT PUG MILL.



WITH OR WITHOUT PUG MILL.

This cut represents our Steam-Power Machine and Pug Mill combined. It is the strongest. It is the best. It is the most simple. It is the most perfect. It does the best work. It works any clay. It does not get out of order. It is not liable to break down. It stands hard usage.

BETTER THAN EVER.

Our machines are this season the Best ever built by our Mr. Henry Martin, whose thirty years' experience has rendered him familiar with the wants of the Trade.

For Strength, Durability, Qantity of Output and Quality of Work, they have no equal.

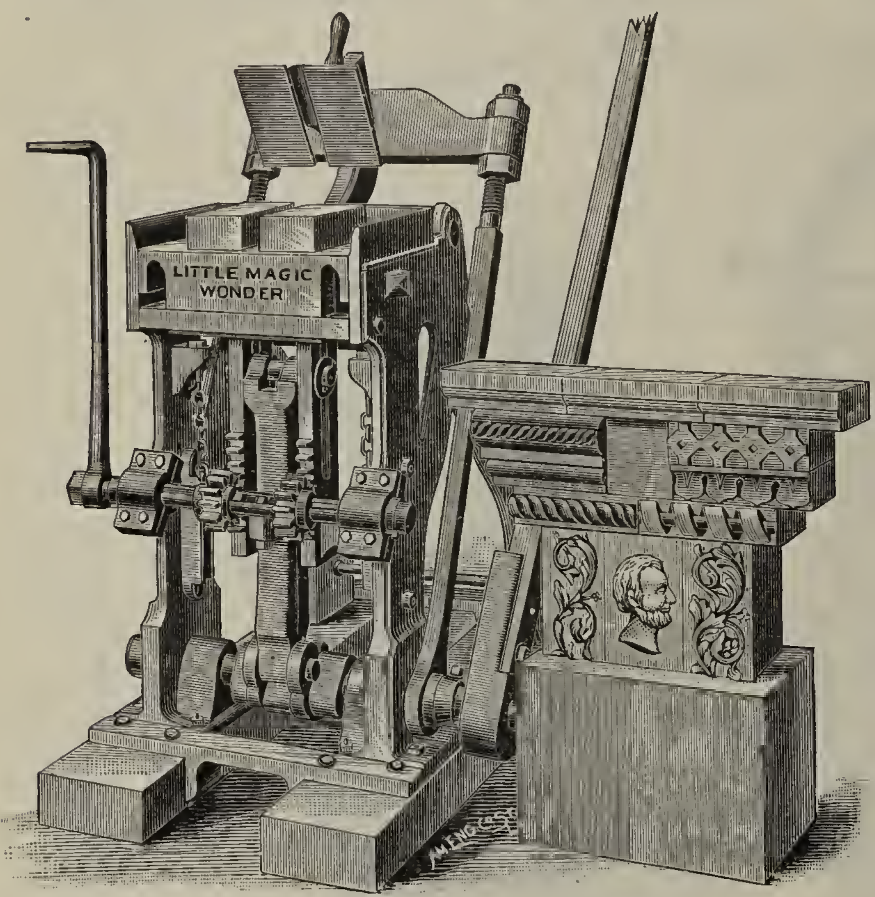
Brickmakers make no mistake when they buy the Henry Martin Machine.

MANUFACTURED BY

The Henry Martin Brick Machine Mfg. Co.,

Send for a Catalogue. LANCASTER, PA., U. S. A

The LITTLE MAGIC WONDER



It Will Do It!

Over 1,000 Different Patterns of Ornamental Bricks Can Be Made on this Wonderful Press.

Hear What a Prominent Brickmaker Says:

St. Louis, Feb. 3d, 1889.

Mr. Wm. Thaison, Austin, Texas:

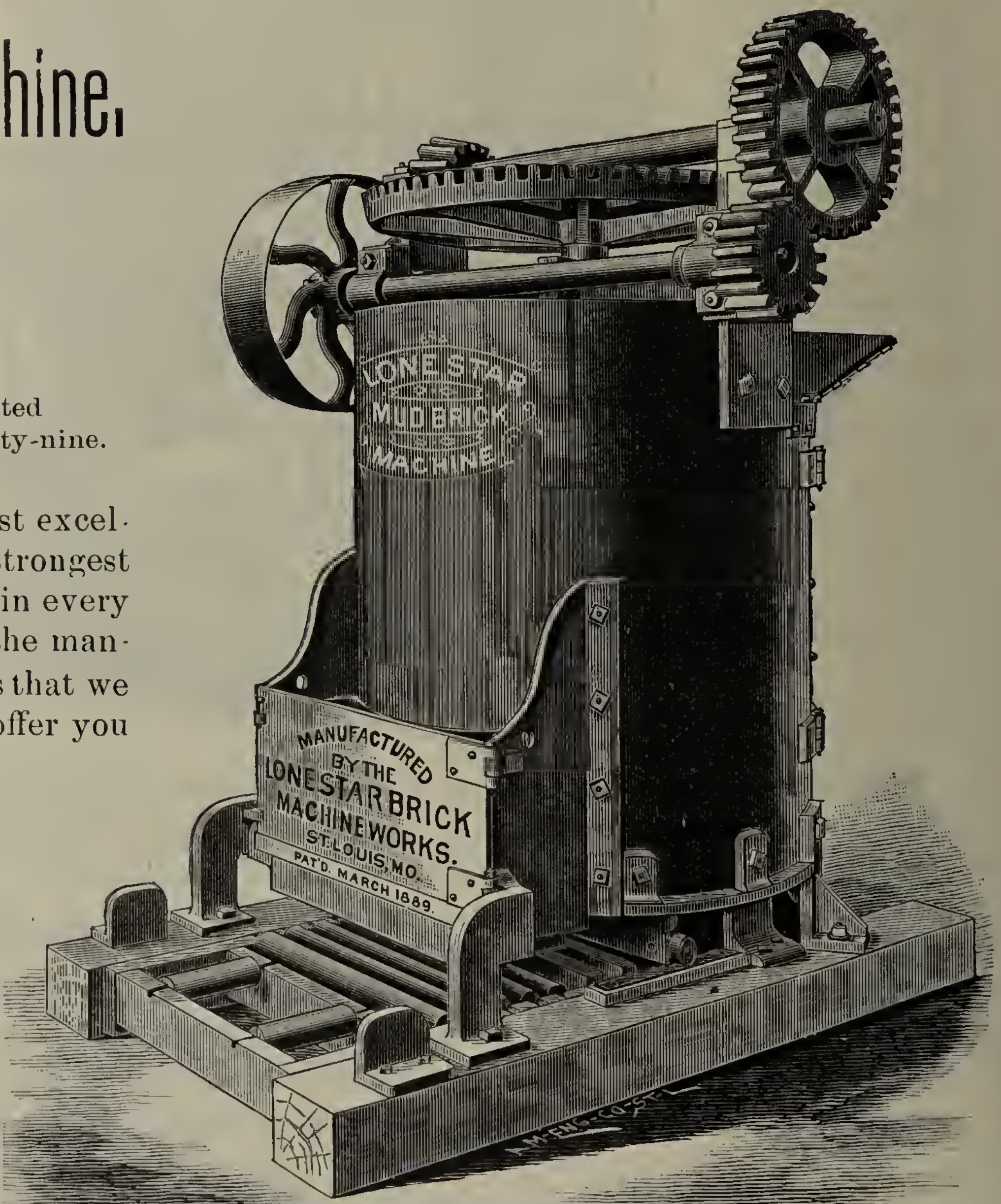
Dear Sir—At the end of a fair and satisfactory trial of your Little Magic Wonder Dry Clay Hand Brick Press, it affords me great pleasure to testify to its efficiency for the purpose intended. I had long been looking for just such a Press, whereon at short notice and at very slight expense we could, within a few hours' time get out small orders for ornamental bricks of special designs and patterns without interfering with the operation and working of our regular machines. The great value of your Hand Press to me, lies in the fact that we can make bricks upon it by pressure on edge as well as flat wise, thus enabling one to make almost any conceivable design of fancy moulded ornamental bricks. As you let your machines go out on trial there can come no loss to parties intending to purchase.

Very Respectfully, Anthony Ittner.

Mr. Ittner runs two of these machines. His reputation as a gentleman and an expert brickmaker is so well and favorably known to the readers of the Clay-Worker that further comment is unnecessary.

The Lone Star Soft Mud Machine.

Here is something new,
That's intended for you,
It's rather a trick,
For the making of brick,
Both handsome and fine
The best of its kind
Has just been invented
In March eighty-nine.



We call your undivided attention to this most excellent Soft Mud Brick Machine. It is of the strongest character and superior to the best in the market in every particular. As we have made arrangements for the manufacturing and putting up of 100 of these machines that we expect to sell this season, we are in position to offer you the most liberal bargains. *Send your order at once and don't delay.*

Capacity:

Steam Power Machine,	30–40,000,	Price $350.00
Horse-Power "	15–20,000,	" 250.00

Our Terms:

One-third cash must in all cases accompany the order to receive recognition or prompt attention.

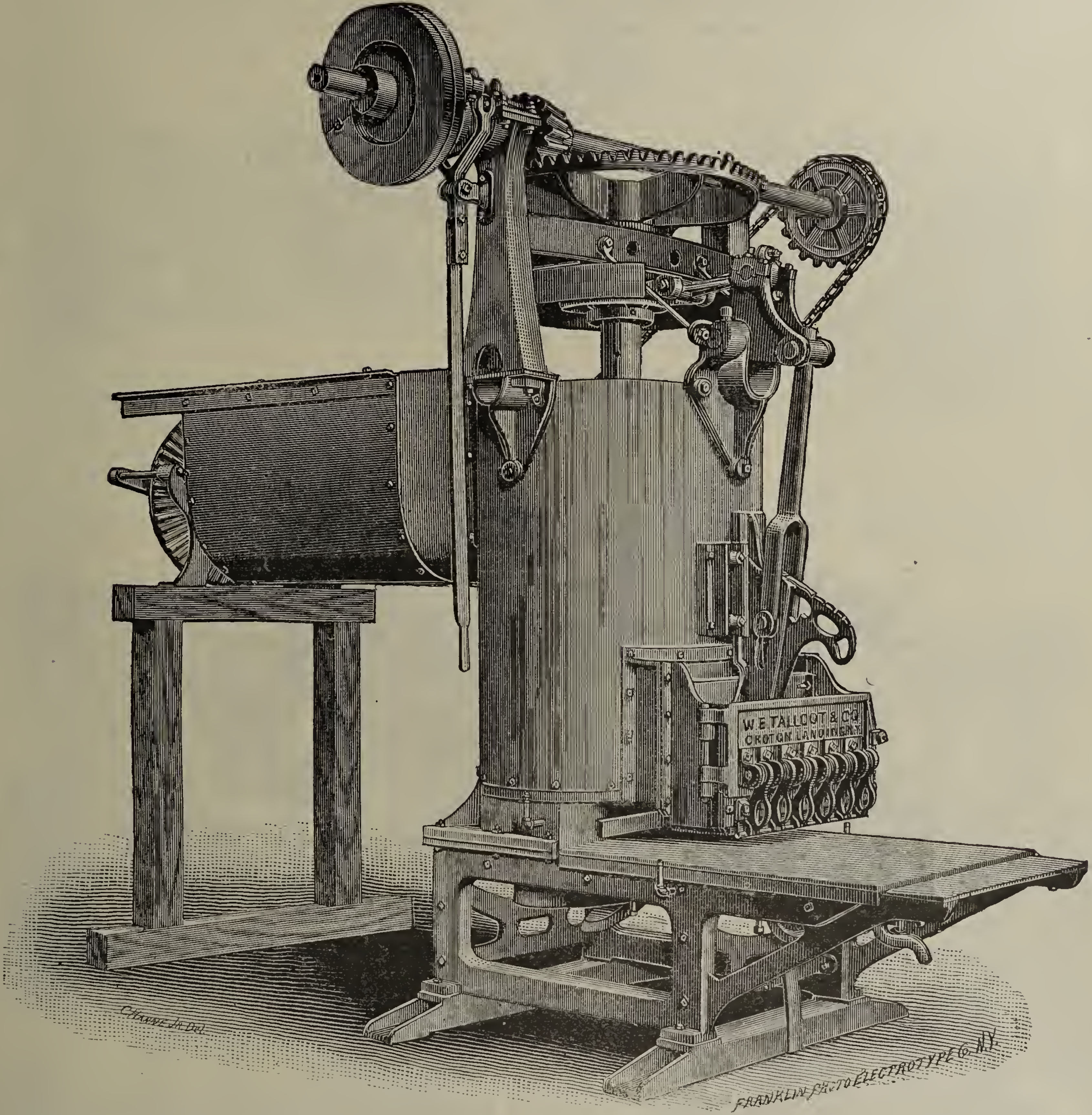
☛For further particulars and circulars address

Lone Star Brick Machine Mfg. Co.,

AUSTIN, TEXAS.

Mention the Clay-Worker.]

W. E. TALLCOT & CO'S.
I. X. L. Brick Machine and Improved Pug Mill.


W. E. TALLCOT & CO.
CROTON LANDING N.Y.
FRANKLIN PHOTO ELECTROTYPE Co. N.Y.

This is a simple and powerful machine, making a superior brick and possessing advantages over all others. It is the result of years of experience in using and manufacturing brick machines. Among its advantages are *Great Strength, Simplicity and Durability* few parts, well protected from sand, yet easy of access for adjustment, renewal and repair. No wood is used in its construction; it is made all of iron and steel. Perfect automatic action to prevent breakage by stones or other obstructions. Great tempering capacity and ability to mould very stiff clay. It is easily understood, easily operated, easily kept in order. Quality of brick made, unsurpassed

The I. X. L. is eipecially designed and built for heavy work. Weight of Machine and Pug Mill 10,000 pounds. Weight of Machine without Pug Mill, 7500 pounds. Send for circular and prices.

It will pay you to use the I. X. L.

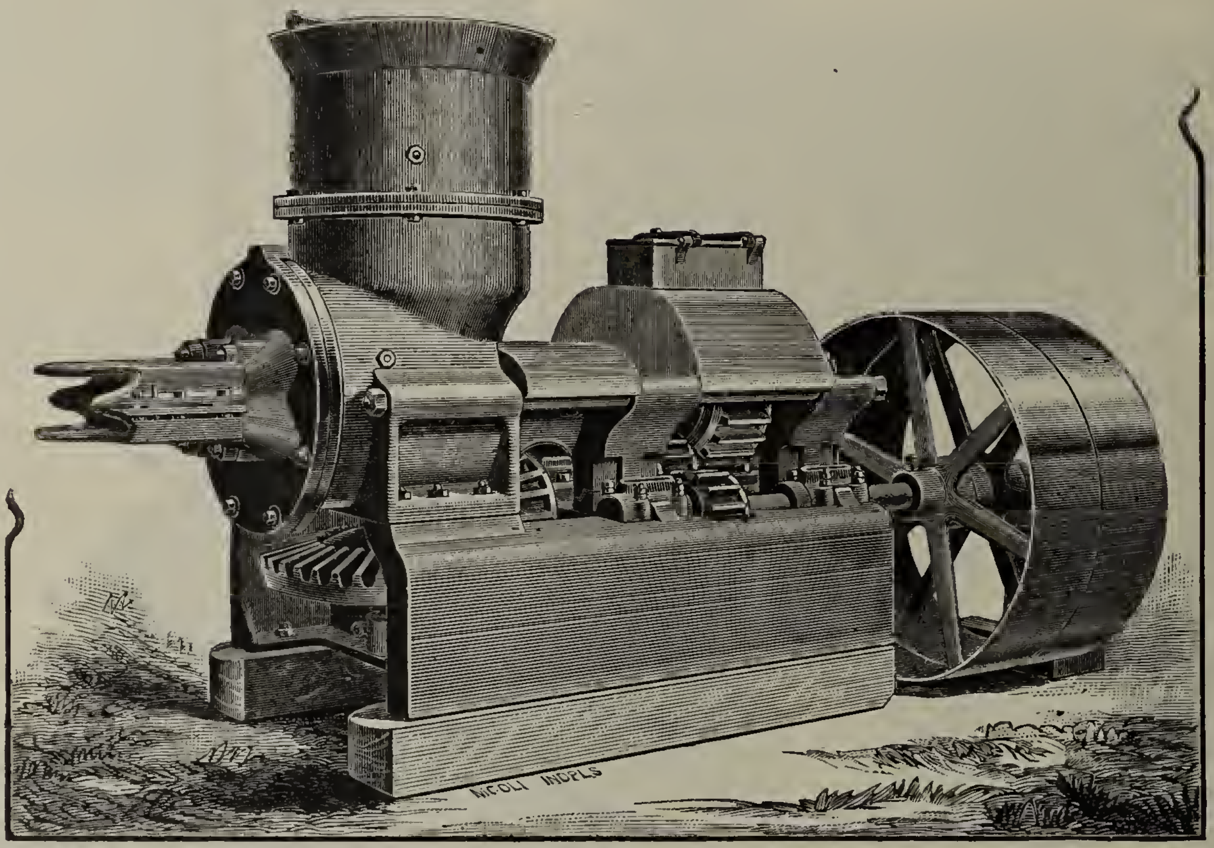
W. E. TALLCOT & CO.,

Croton Landing, New York

The Wallace Manufacturing Company,

FRANKFORT, INDIANA.

In the antique races we may have been beaten but Ben Hur is now holding the reins on a new team—the Little and Big Wonder which we are confident will roll up a good bank account for any one who will invest their money in them.



The above cut represents the Little Wonder in its new dress.

The Big Wonder with Automatic Table will appear in the near future.

For full particulars of the Big and Little Wonder, Automatic Table, Clay Crushers and Stone Separators, Pug Mills, Trucks, Iron Cars and other Clay Working Supplies, write to

THE WALLACE MFG. CO.,

Mention the Clay-Worker.] FRANKFORT, IND., U. S. A.

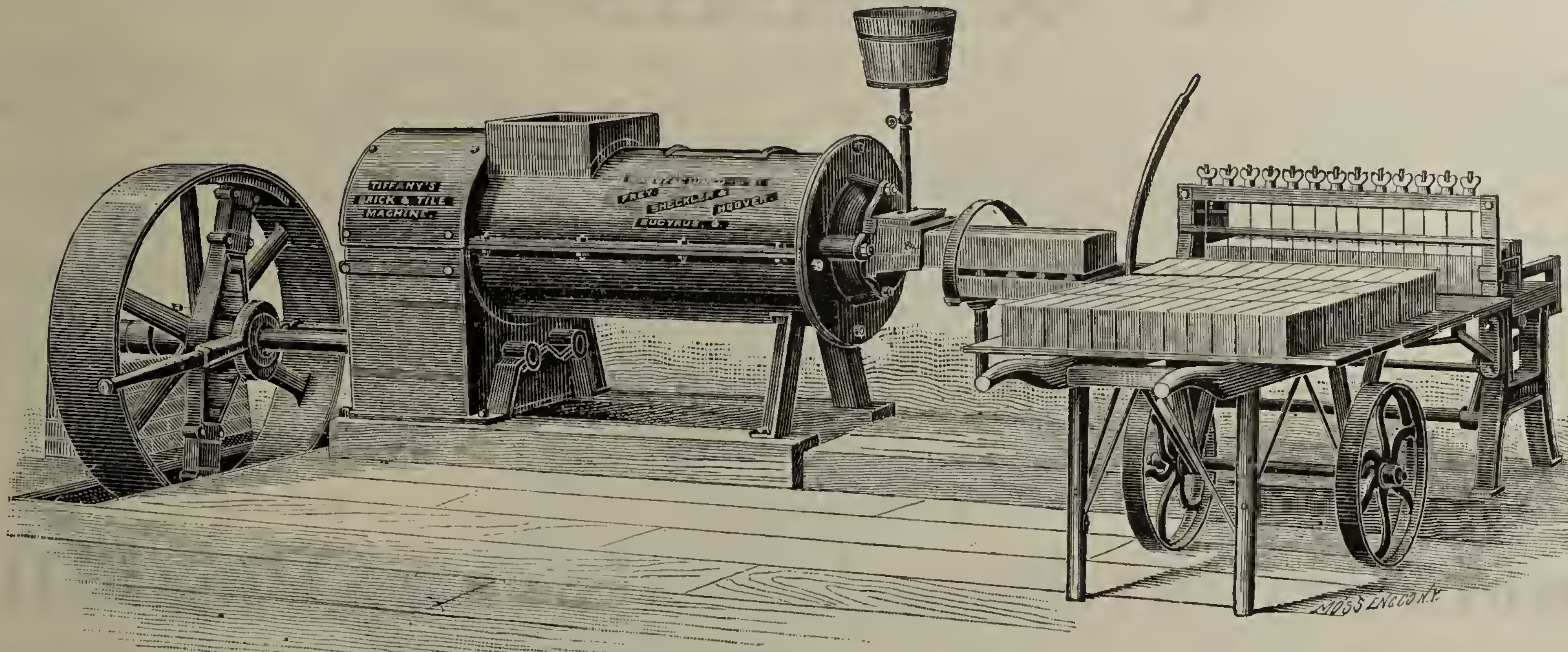
THE FREY, SHECKLER CO.

BUCYRUS, OHIO

With increased facilities threefold.

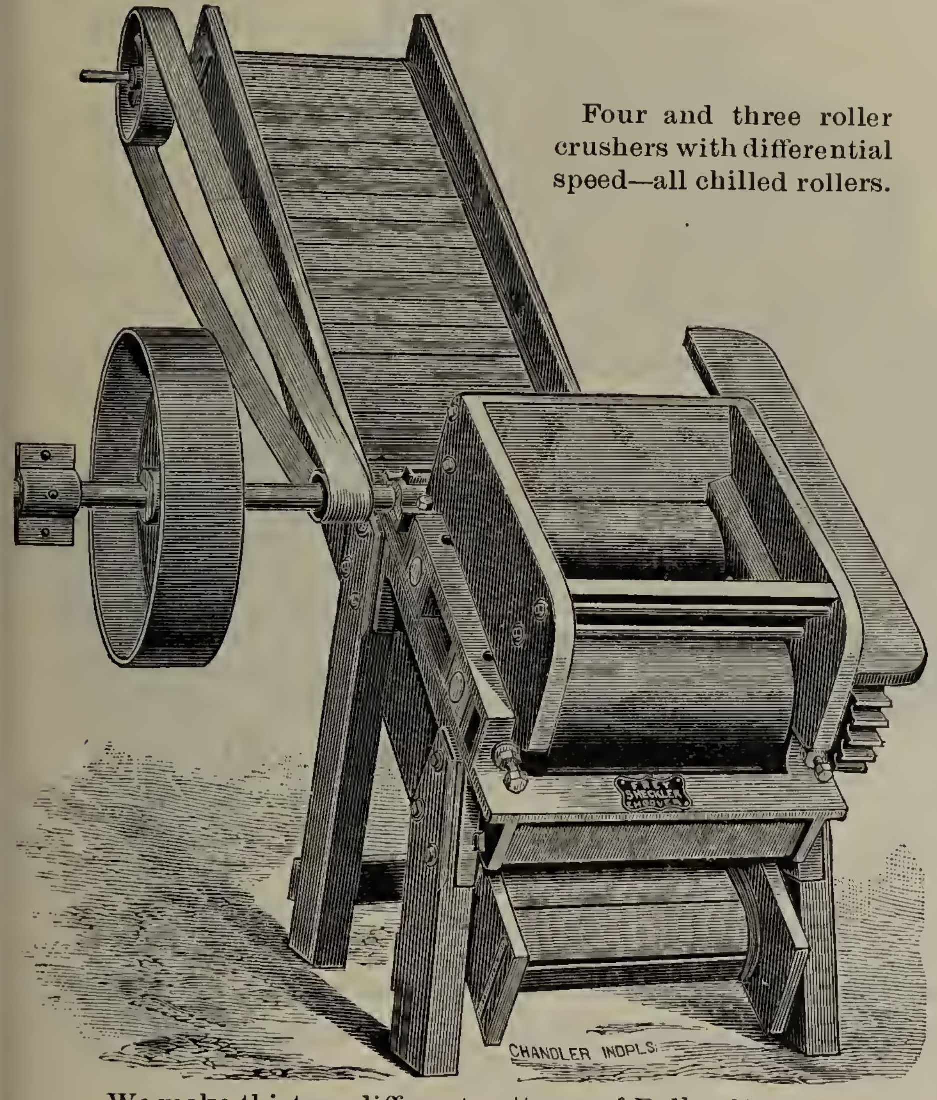
Seven different brick machines. Four different tile machines. Will make any quantity of brick or tile as desired.

The Mascot for light power and low in price.


TIFFANY'S BRICK & TILE MACHINE
FREY SHECKLER & HOOVER BUCYRUS, O.
MOSS ENG CO N.Y.

CUT OF CENTENNIAL WITH SELF-LOADING ATTACHMENT ON CUTTING TABLE.

The above cut shows the Board Delivery Cutting Table which loads the brick automatically on special trucks in connection with the Centennial Tiffany Machine and Patent Lubricating Brick Die. Acme Special Brick Machine, largest capacity. The Duplex, 80,000 brick per day.

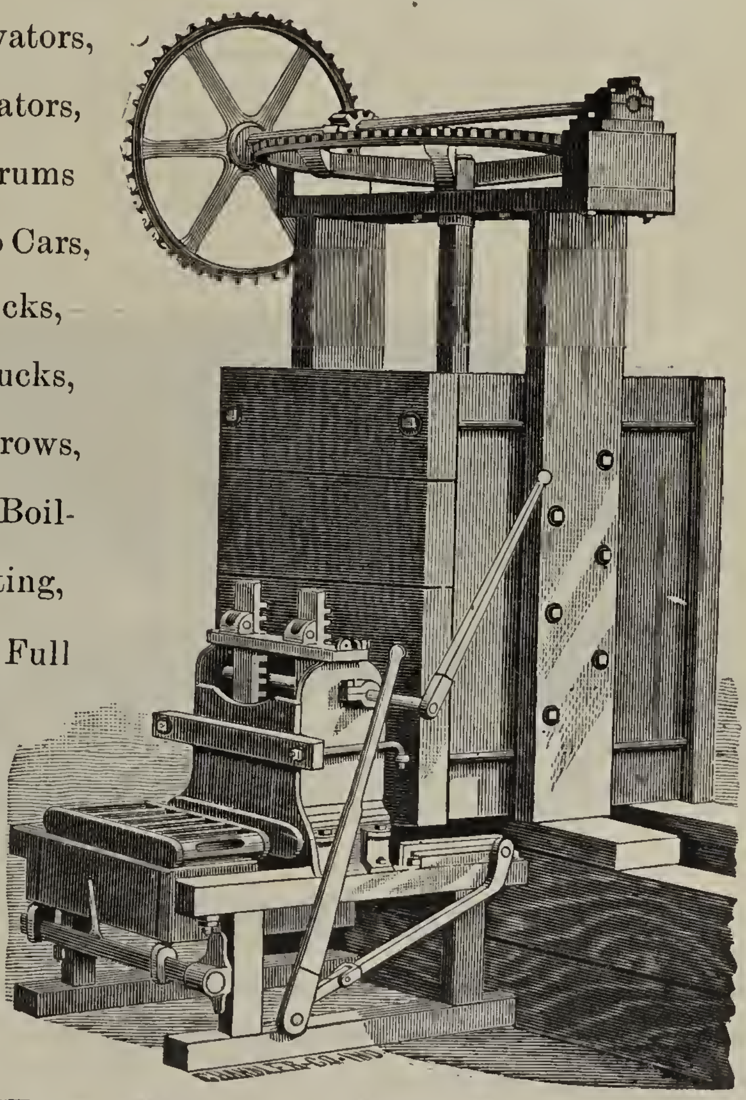


Four and three roller crushers with differential speed—all chilled rollers.

We make thirteen different patterns of Roller Clay Crushers. All rollers best chilled iron.

PLANS FOR KILNS FURNISHED CUSTOMERS.

Clay Elevators, Tile Elevators, Steam Drums and Dump Cars, Tile Trucks, Brick Trucks, Wheelbarrows, Engines, Boilers, Shafting, Pulleys. Full outfits for Brick and Tile Factories and Fire Clay Works.



The Eagle Brick Machine.

Cheapest and Simplest for Horse and Steam power.

(16,000 brick per day.)

Send for illustrated circulars to

The FREY, SHECKLER CO., Bucyrus, Ohio.

Of Interest To Every Brickmaker Intending To Purchase Disintegrators.

A WARNING.

Jonathan Creager's Sons, of Cincinnati, Ohio, are now manufacturing a Clay Disintegrator which is an infringement on our Patents. We have brought suit against them in the United States Circuit Court for the Southern District of Ohio.

We presume that this will be accepted as a sufficient answer to their statements in May number of Clay-Worker that our former notice was meant for bluff only.

We intend fully to protect our rights, and only waited until it was apparent that they were being wilfully infringed to bring suit.

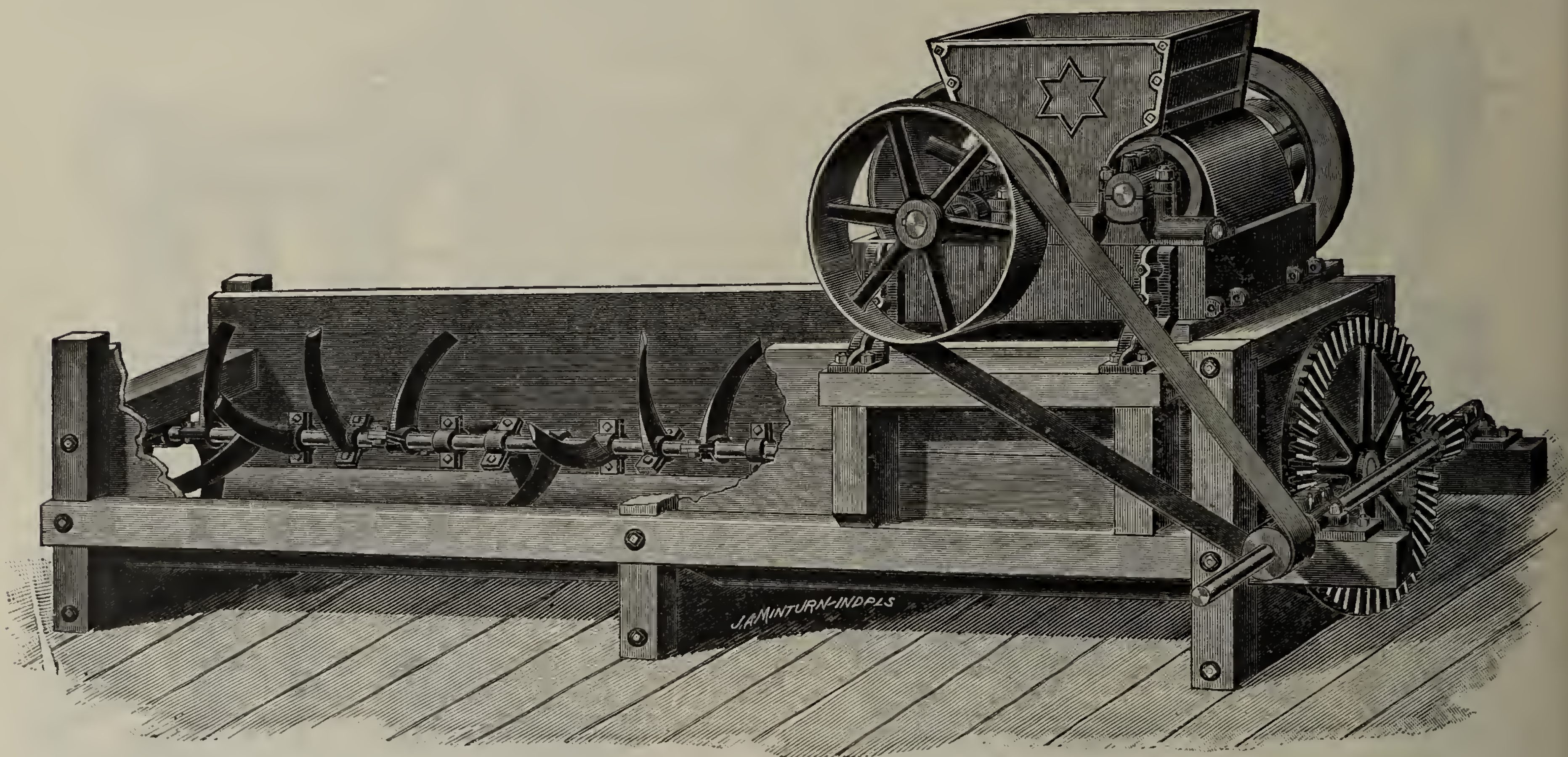
Our Patents are numbers 322,393, *dated July* 14*th,* 1885, 368,898 *dated August* 23*rd,* 1887, *and* 384,278 *dated June* 12*th,* 1888.

Always Buy The Best

AND ONLY

Combined Clay Disintegrator and Pug Mill

The only machine that will work any clay direct from the bank, either wet or dry, thoroughly pulverizing all lumps, clods, and stone. It will not clog or choke It requires no extra man to punch the clods into it. The rolls do not wear or break as roller crushers do, necessitating a new set of rolls every two or three months.



It Will Save Its Cost In A Short Time.

The Pug Mill will thoroughly mix and temper the clay, putting it in better condition for making mud brick than can possibly be done with the soak pit. It will save from three to five dollars per day in labor and make better quality of brick.

C. & A. POTTS & CO.,

INDIANAPOLIS, - - INDIANA.

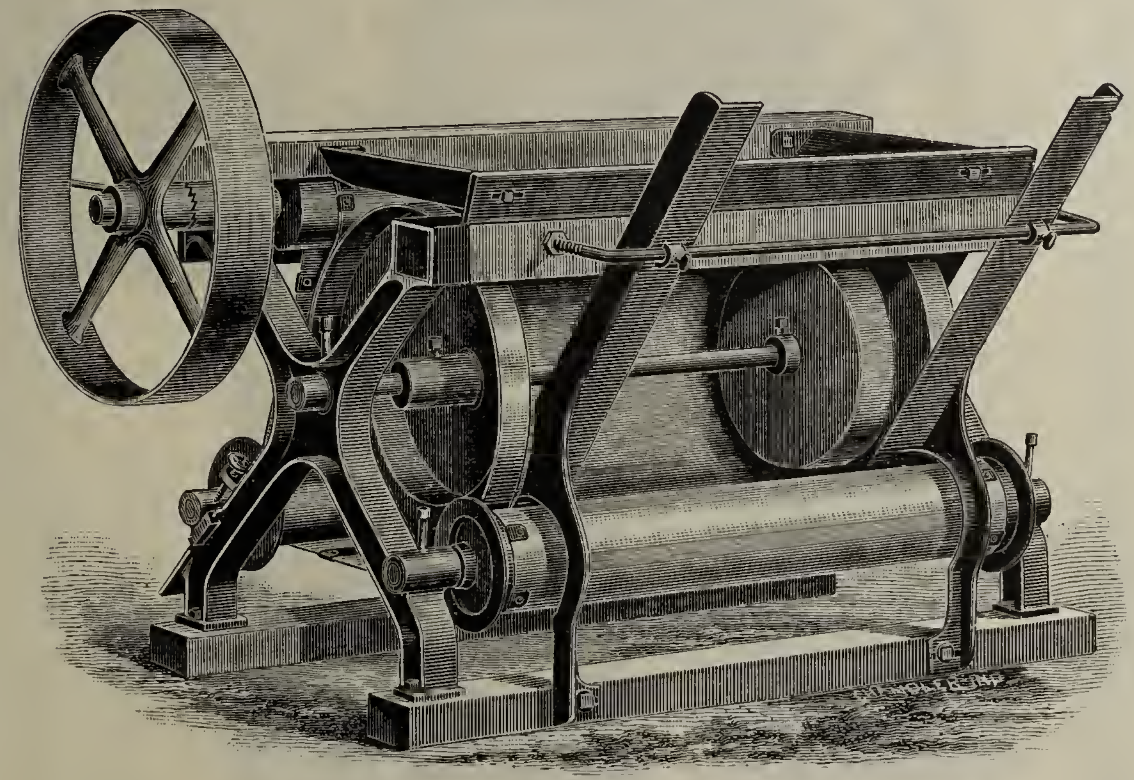
BRICKMAKERS, READ!

What a Few of The Users of Our Sander Say:

C. & A. Potts & Co:

GENTS:—As to your Mould Sander, we can only say that we could not ask for a machine that is nearer perfection both as regards simplicity and efficiency. It does not and cannot leak. The moulds do not and cannot clog or catch, and we are satisfied with it in every way. You are at liberty to use this in any way you may see fit and we shall be pleased to answer any inquiries, or show the machine at any time to any one you may send here. We are yours truly,

BERLIN BRICK CO.



W. H. Cater, Brick Manufacturer.

Appleton, Wis., May 25th, 1889.

C. & A. Potts & Co.:

GENTS:—I have set your Sanderand given it a fair trial. It is just what I want and is just what you claim for it, and has given perfect satisfaction. Yours truly,

W. H. CARTER.

No Brickmaker using Brick Machinery can afford to be without this machine. It sands the moulds more perfectly than can be done by hand, every mould being sanded the same. It does not Waste or Spill the sand. The moulds cannot catch and cause delays. It never strikes for more wages, but is always ready for work.

All machines are guaranteed to do all claimed and will be shipped subject to approval.

Prices lower than any. Write for illustrated circular.

We also manufacture a full line of Brick Yard Supplies.

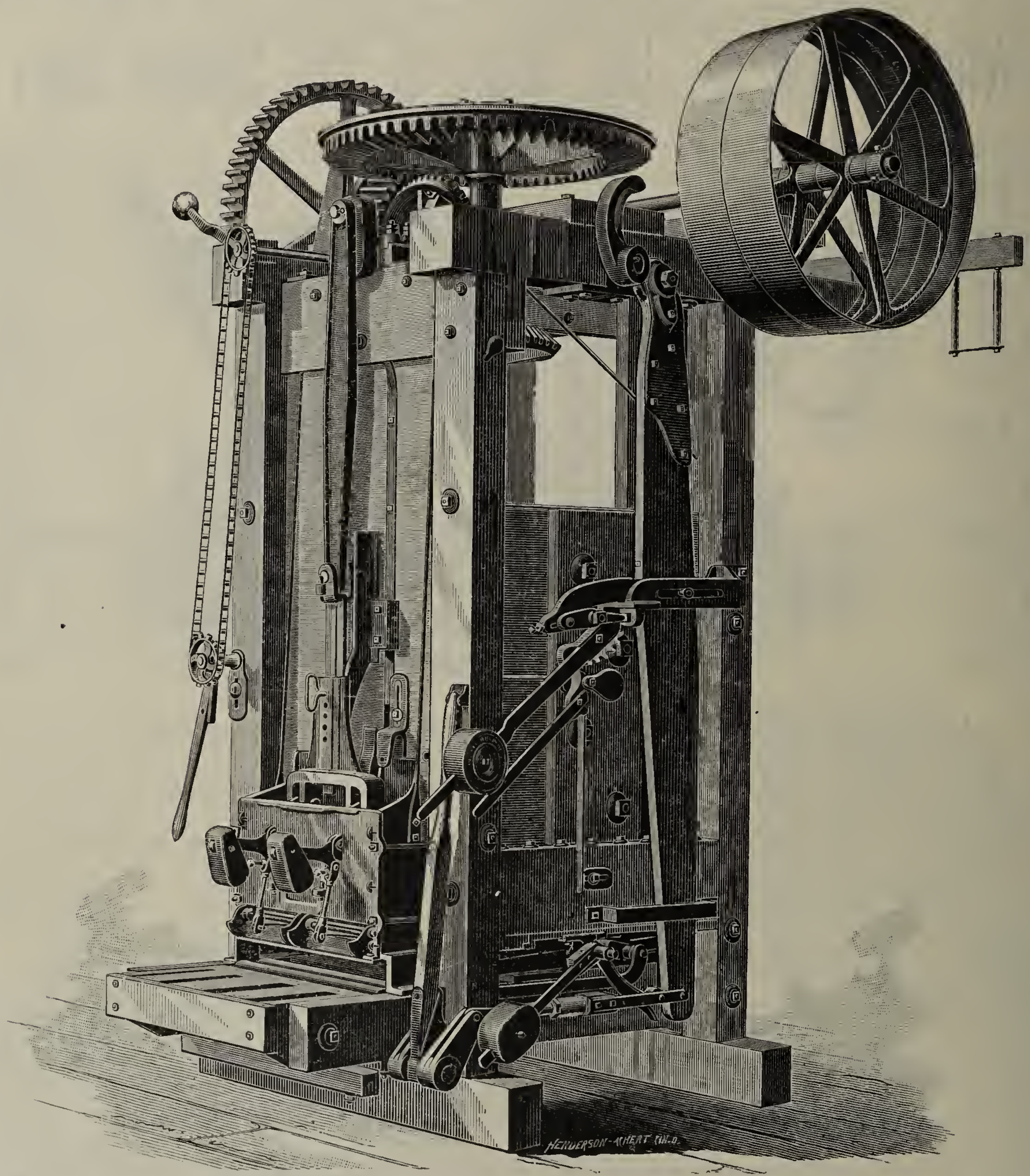
C. & A. POTTS & CO.

☛ **NOTICE:**—A. H. Newton, of Cohoes, N. Y., claim our machine is an infringement on patent owned by them, and that persons using our machine will be prosecuted. As to this we would say that we do not infringe said patents; that we have put our machines on the market only after a careful investigation, to ascertain exactly what our rights are in the premises, and, being fully satisfied of our rights, we are prepared to protect our customers and Patents No. 397,274 of Feb. 5, 1889.

C. & A. POTTS & CO.,

[Mention the Clay-Worker.] INDIANAPOLIS, INDIANA

The "Tiffin" AUTOMATIC Brick Machine


HENDERSON-ACHERT CIN.O.

The "Tiffin" **Automatic** Brick Machine is, **beyond question,** the best machine of its class in the market. It is **Heavy, Strong and Durable. IT IS GUARANTEED TO DO GOOD WORK.**

The **"TIFFIN"** is made for use by **Steam,** or **Horse** power. The capacity of the **Horse Power Machine** is 18,000 to 20,000 per day, and of the **Steam Power** 25,000 to 40,000 per day, according to the speed at which they are operated.

Both styles are equipped with our **Automatic "Stone Doors,"** which permits a stone, or any other hard substance, that may have passed in with the clay, to pass out **without breakage to the Machine.**

PRICES:	Steam Power Machine - -	$350.00
	Horse Power Machine -	$250.00

The principal shafts are of Steel, and all other material used, is **First Class. Competent Workmen Only Employed** in their onstruction. These machines have been **Thoroughly Tested** in the hands of **Experienced Brickmakers** during the past season, and with the most **Satisfactory** results to them. Parties who may be **Interested Enough** to wish to make inquiry, will be given the names and address of the parties who have had them in use.

We are the makers of the **CELEBRATED "OLD RELIABLE"** Brick Machine, for use by hand power, which is so well and favorably known to the Brickmakers of the entire country. We are also manufacturers of Turn Tables, Trucks, Wheel Barrows, Molds, Kiln Doors, Etc., Etc. Correspondence solicited.

TIFFIN AGRICULTURAL WORKS,

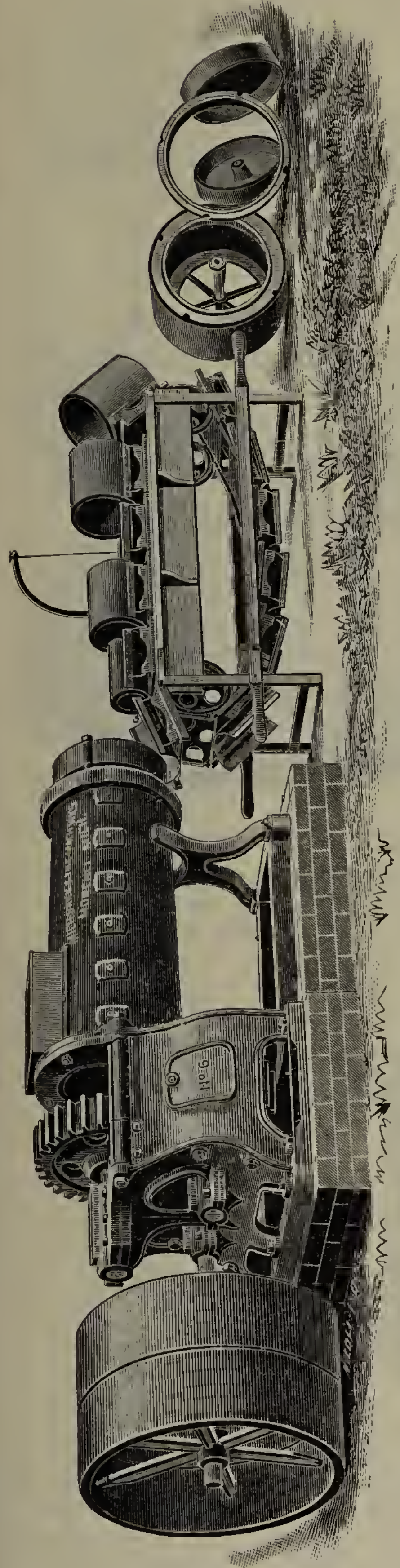
[Mention the Clay-Worker.]

TIFFIN, OHIO.

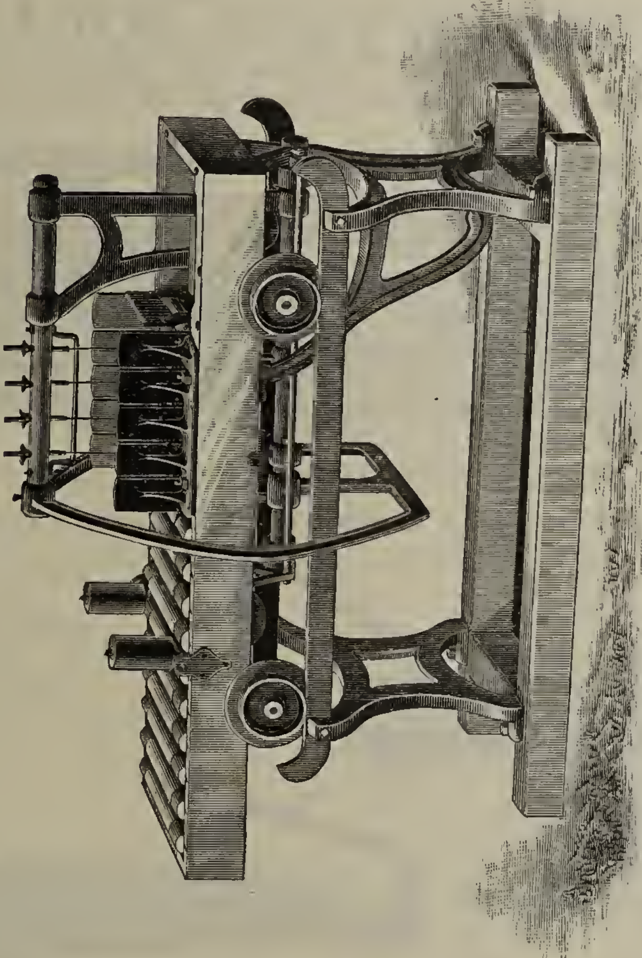
Michigan Brick & Tile Machine Works,

—MANUFACTURERS OF—

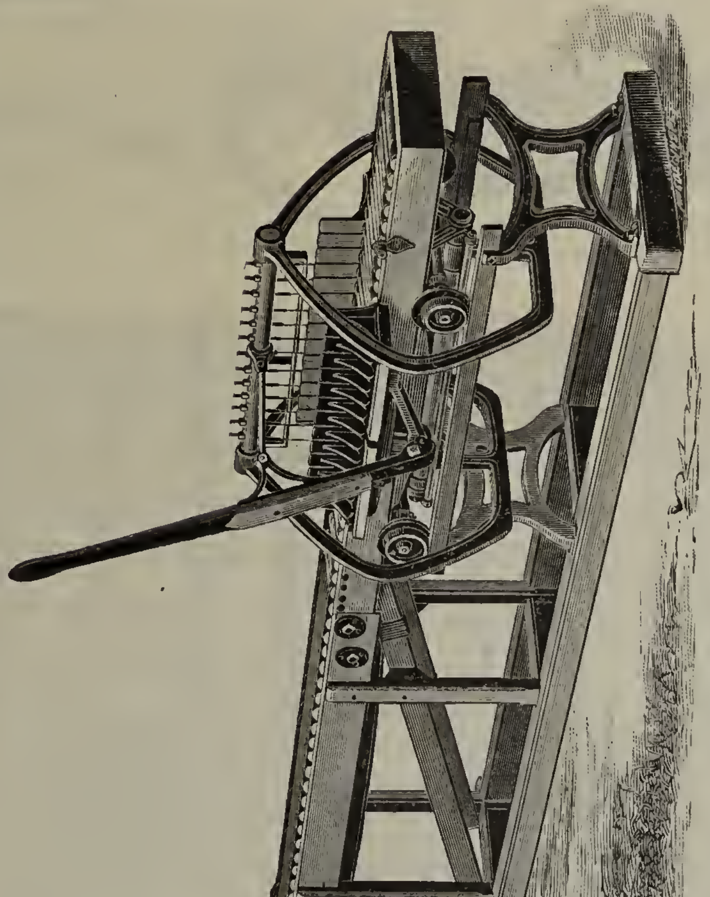
BRICK AND TILE MACHINERY.



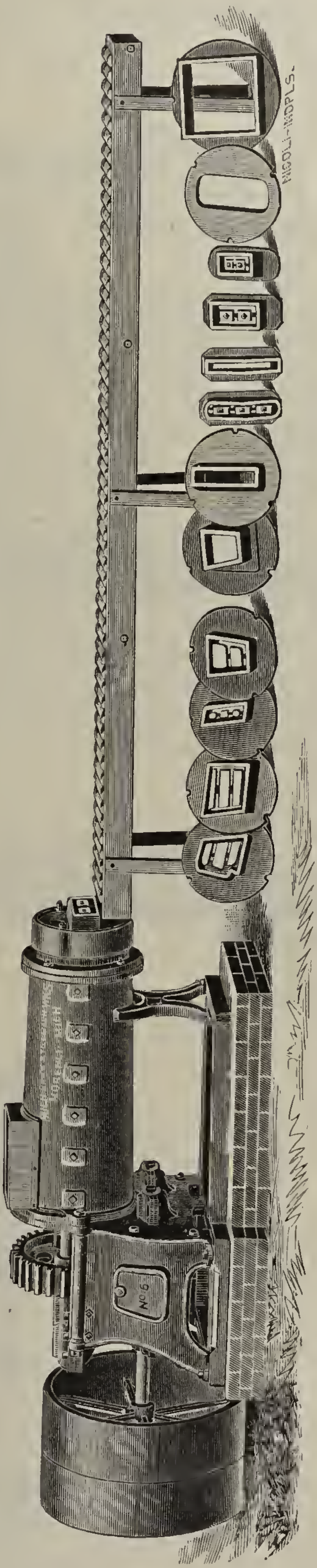
No. 6 Special Brick and Tile Machine.



No. 1 Curved Side-Cut.



Special No. 6 Curved Side Cut.



No. 6 Terra Cotta Lumber Machine.

☛Send for Descriptive Circular.

MICHIGAN BRICK AND TILE MACHINE WORKS,

Lenawee County, [Mention the Clay-Worker]. MORENCI, MICH., U. S. A

CHAMBERS BROTHERS CO.,

FIFTY-SECOND ST., BELOW LANCASTER AVE,

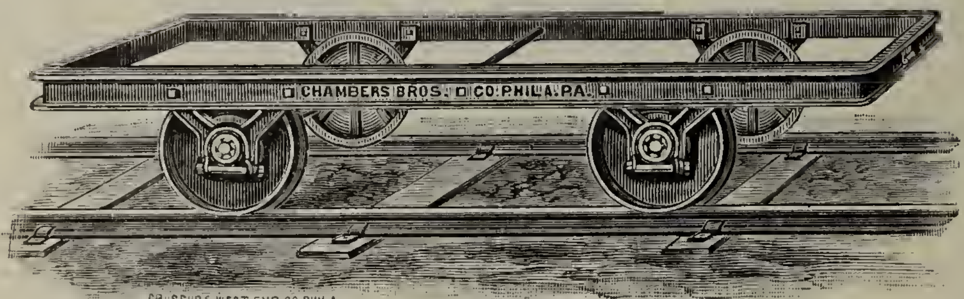
PHILADELPHIA, PA

Improved Tunnel Dryers For Common Brick

And the Most Durable and Complete System for Transporting Green Brick.

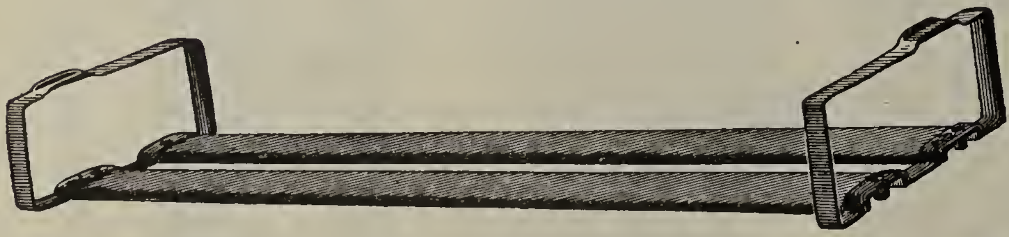
The Strongest Car Made.

The Strongest Car Made.


CHAMBERS BROS. CO. PHILA. PA.
CHASSUP & WEST. ENG. CO. PHILA.

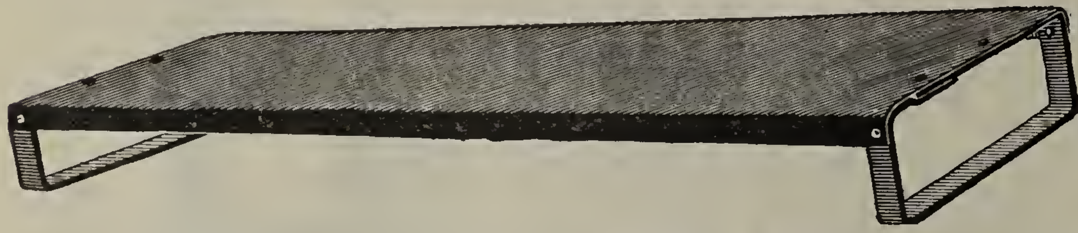
CHAMBERS' WROUGHT-BODY DRYER CAR.

A lower priced Car with cast iron bodies made to order.

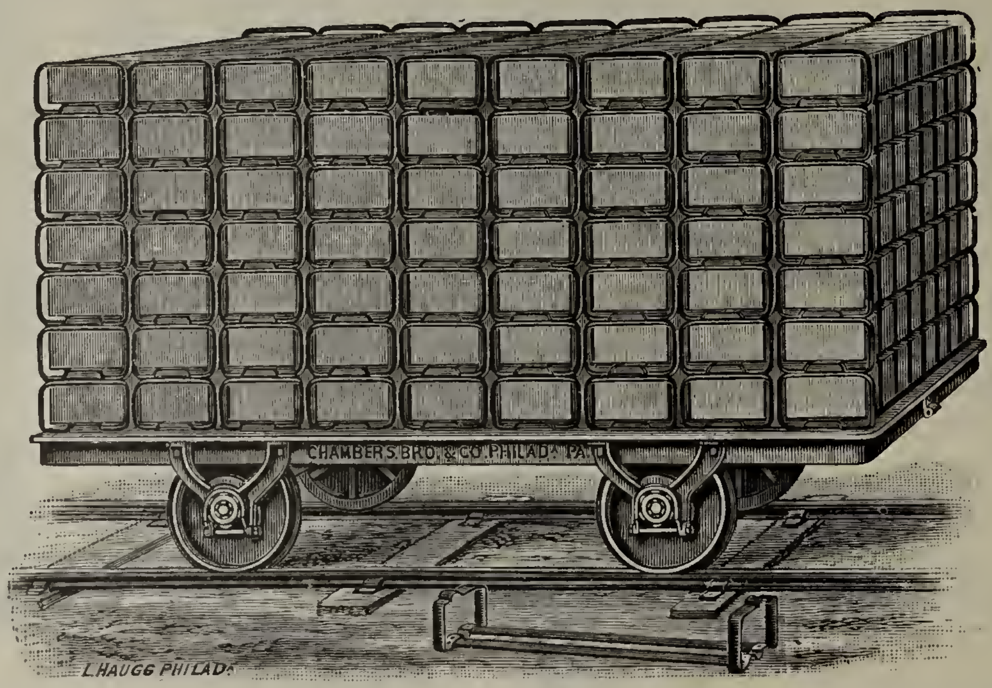


☛ Wrought Iron Interlocking Pallet for Stiff Tempered Brick only.

Steel Pallet for brick placed on flat side or on edge. ☛



☛ Steel Pallet for soft moulded brick, or those placed on flat side only.


CHAMBERS BRO. & CO. PHILAD^A PA.
L. HAUGG PHILAD^A

CHAMBERS BROTHERS COMPANY,

PHILADELPHIA, - - PA.

☞See ad. on front cover page.

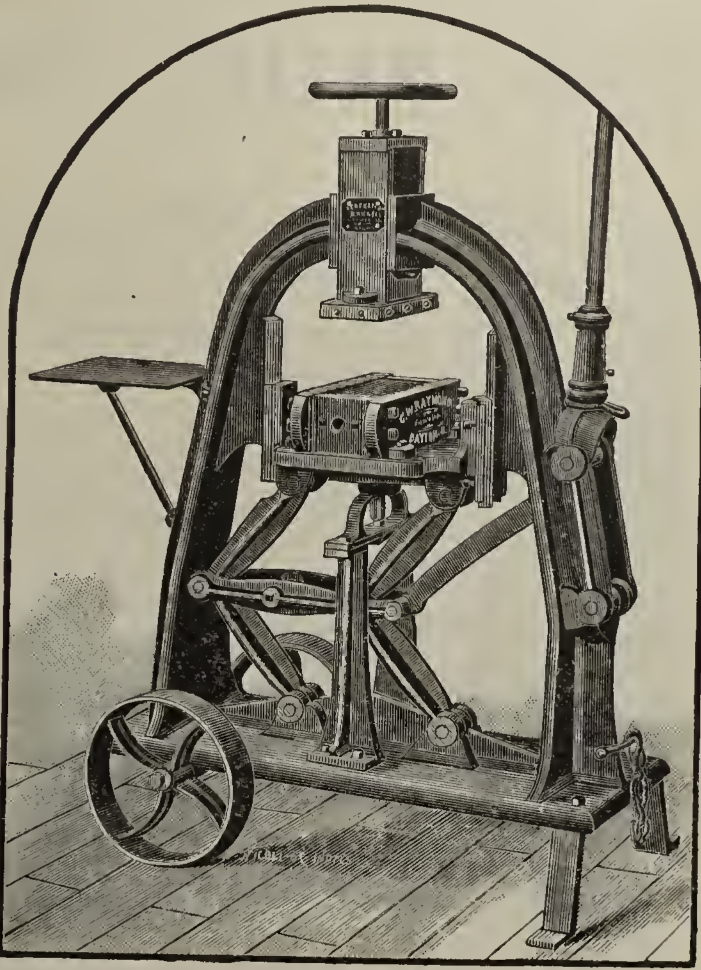
[Mention the Clay-Worker.]

RAYMOND'S PERFECTION BRICK PRESS.

(NO. 1 FOR RED BRICK. NO. 2 FOR FIRE BRICK.)

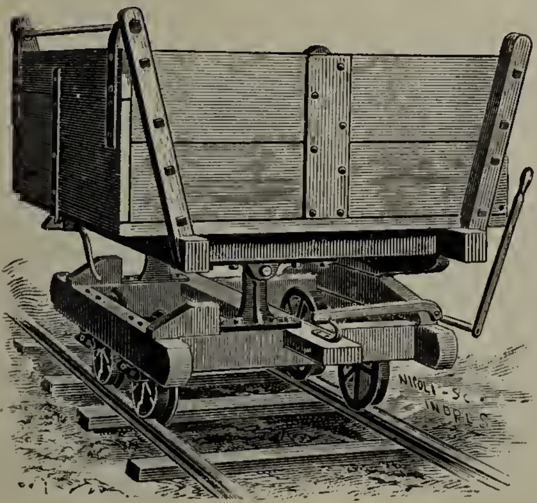
SIMPLE, POWERFUL.

Its whole action is derived from a short, easy, but powerful movement of one lever. A Perfect press which turns out perfect work.



——MANUFACTURERS OF——

AUTOMATIC DUMPING CARS,



For Brick Yards, Gravel Pits, Plantations, Mines, Etc.

SAVES TIME.

SAVES LABOR,

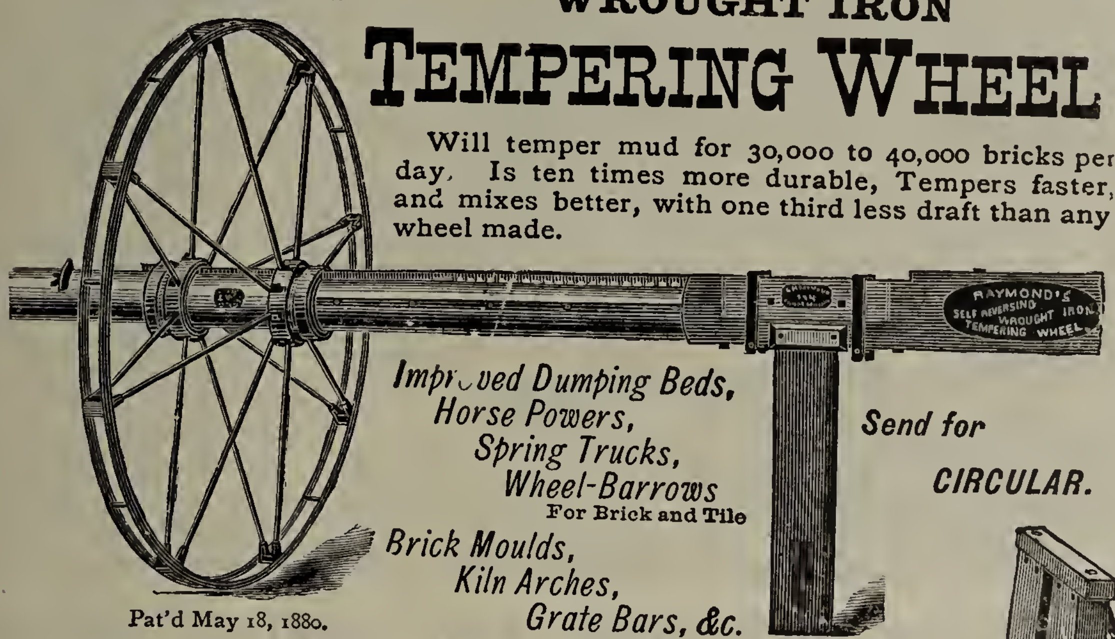
SAVES MONEY.

Write for Illustrated Catalogue giving full description.

RAYMOND'S **WROUGHT IRON**

TEMPERING WHEEL

Will temper mud for 30,000 to 40,000 bricks per day. Is ten times more durable, Tempers faster, and mixes better, with one third less draft than any wheel made.


RAYMOND'S SELF REVERSING WROUGHT IRON TEMPERING WHEEL

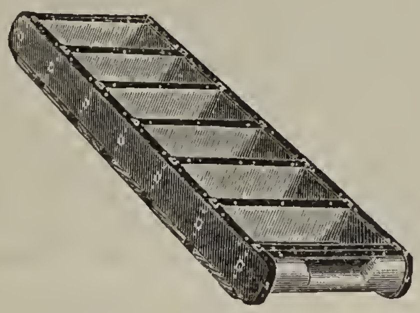
Pat'd May 18, 1880.

Improved Dumping Beds,
Horse Powers,
Spring Trucks,
Wheel-Barrows
For Brick and Tile
Brick Moulds,
Kiln Arches,
Grate Bars, &c.

Send for CIRCULAR.

BRICK MACHINE MOLDS.

We manufacture a great number and variety of molds and with improved machinery, we are able to fill orders with dispatch. Our molds are made of the best of cherry wood



with side pieces gained for partitions and each partition is in turn dove-tailed into the sides. **They are thoroughly iron bound.** The cross-irons being dove-tailed. Without doubt, the most substantial mold made.

BRICK BARROWS.

Our Barrows are made from the best of seasoned white-oak; braced in front and cross braces underneath; iron wheel and axle and three coats of paint; the frame is morticed throughout. They will stand the rough usage of the brick yard. For strength and durability they have no equal.

C. W. RAYMOND & CO.,

7 & 11 WAYNE STREET, (Mention Clay-Worker.) DAYTON, OHIO.

A. POTTS & CO.,

INDIANAPOLIS, INDIANA.

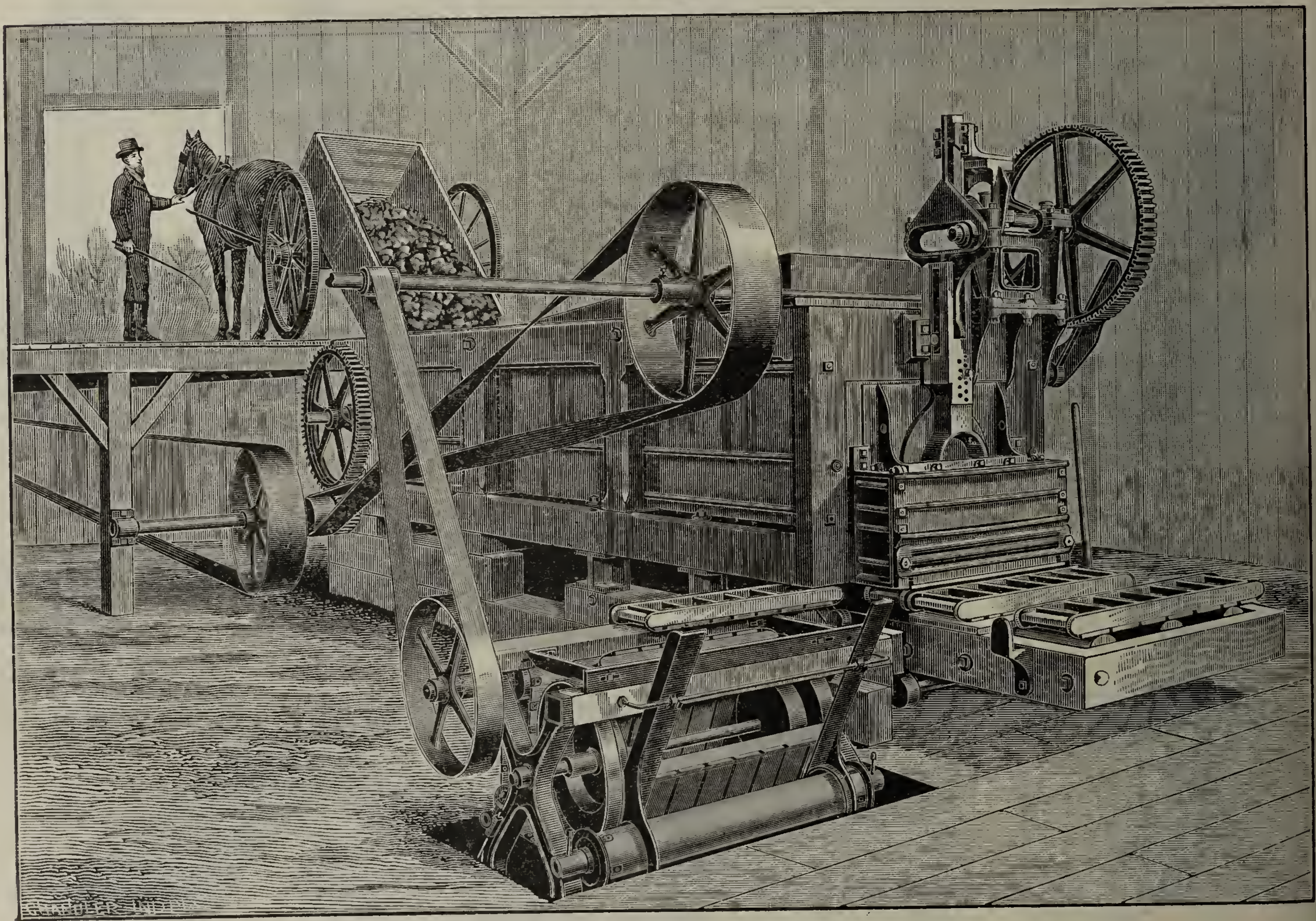
—MANUFACTURERS OF—

BRICK MAKING AND CLAY WORKING MACHINERY,

Including

Sand Mould Brick Machines, Pug Mills for Soft and Stiff Clay,
Mould Sanders, Disintegrators, Elevators, Kiln Castings and Yard Supplies.

We are prepared to erect complete plants of any desired capacity.



OUR HORIZONTAL STOCK BRICK MACHINE AND MOULD SANDER

Is the best machine on the market for making sand moulded brick.
It is strong and powerful and will work the clay stiff enough to make the finest stock brick.
It works the clay direct from the bank not requiring extra Pug Mills as all vertical machines do.
It has no equal for Strength, Durability, Quantity and Quality of brick made.
It has no light complicated parts underneath machine, all parts being out where they can be kept clean.
Don't fail to write if in need of machinery in our line. Our prices are the lowest.
We shall be pleased to mail our complete descriptive circular.

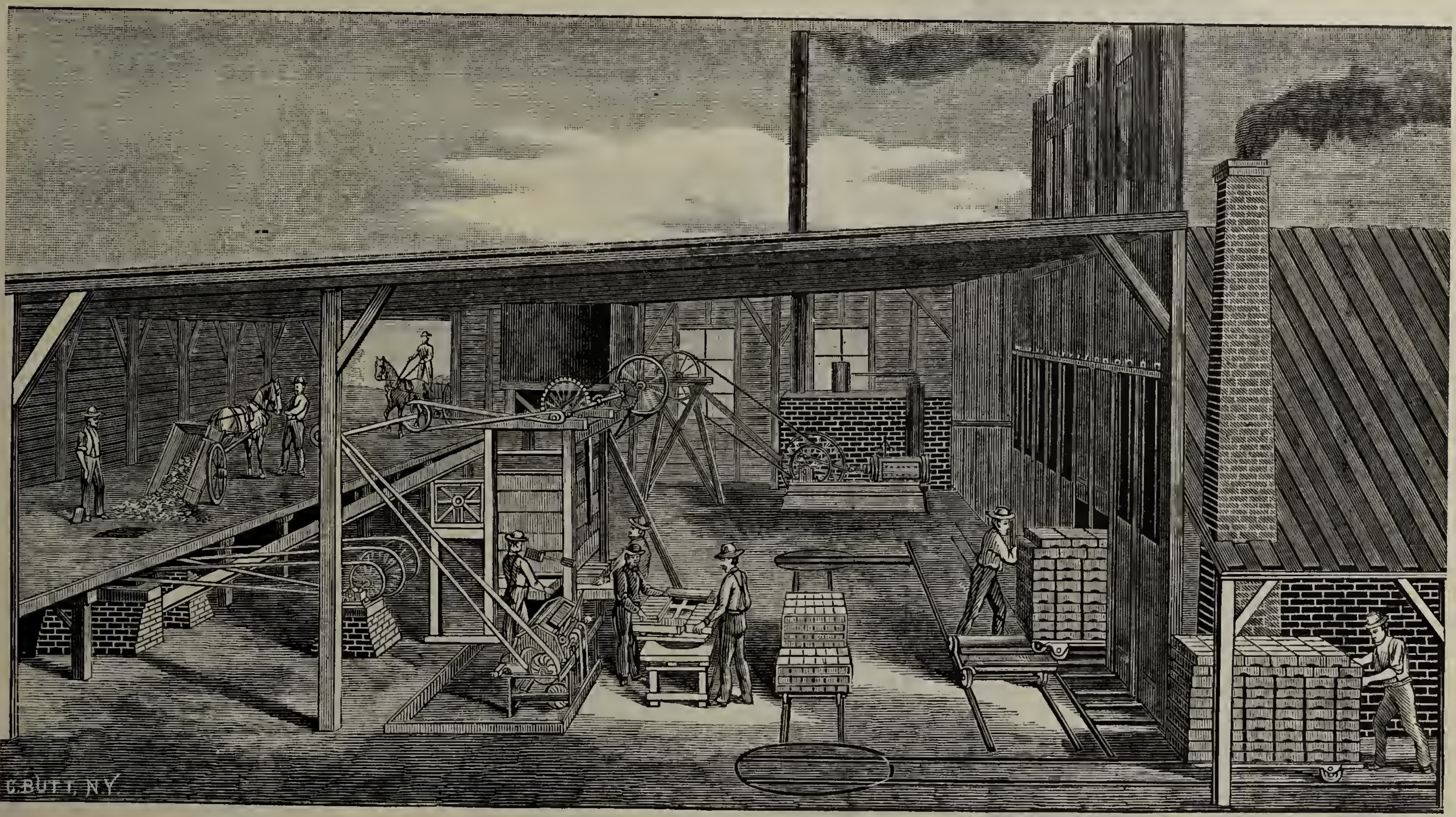
ADDRESS

A. POTTS & CO., - - Indianapolis, Indiana.

SHARER'S IMPROVED DRYER

☞ More than one hundred now in use **DRYING SUCCESSFULLY** Soft Mud Brick, Stiff Mud Brick, Pressed Brick, Fire Brick, Hollow Brick, Tile, Plaster, Architectural Terra Cotta, Terra Cotta Lumber, Peat and Lumber. ☜

No other Dryer in existence can successfully dry such a variety of Materials.



27 have been built the present season and are now in successful operation.

The Only Successful Soft Mud Brick Dryer in Existence.

Will also dry Stiff Mud, Semi Dry and Pressed Bricks at 50 per cent. less cost than any Steam Drier.

No other Dryer will Guarantee to dry Soft Mud Brick. I Guarantee to dry any kind of Bricks.

It is not a Direct Heat Dryer, nor a Steam Heat Dryer. It is a Radiated Heat Dryer. The heat being produced from Coal, Wood, Coke, Oil, Gas or any kind of Fuel, and Radiated through Brick or Metal floor. The heat can be so graduated as to successfully dry the most Tender or Refractory Clays without damage. While in a Direct Heat Drier the product of combustion coming directly in contact with the material to be dried will warp, check and crack in most cases. In a Steam Drier the heat cannot be graduated. Neither can heat be produced from Steam near as cheaply as from the Fuel Direct. With a Steam Dryer it is necessary to run one or more Boilers and Exhaust Fans day and night. There is No Machinery whatever necessary to operate my Dryer. Hence the wear and tear and expense of operating is reduced to the minimum.

References and all information given by letter or otherwise. Address,

GEO. W. SHARER, Proprietor,

8 South Broad Street, Room No. 1,

ED. H. CALLAWAY, Gen'l Agent, 72 Reade St., New York.
E. A. KING, Special Agent, New England States, 48 Congress St., Boston, Mass.
HUGH CAMERON, Toronto, Ont., Special Agt. Dominion of Canada.

PHILADELPHIA, PA.

St. Louis Iron and Machine Works, Irn Founders and Builders of Heavy Machinery.

ESTABLISHED 1854.
INCORPORATED 1875.

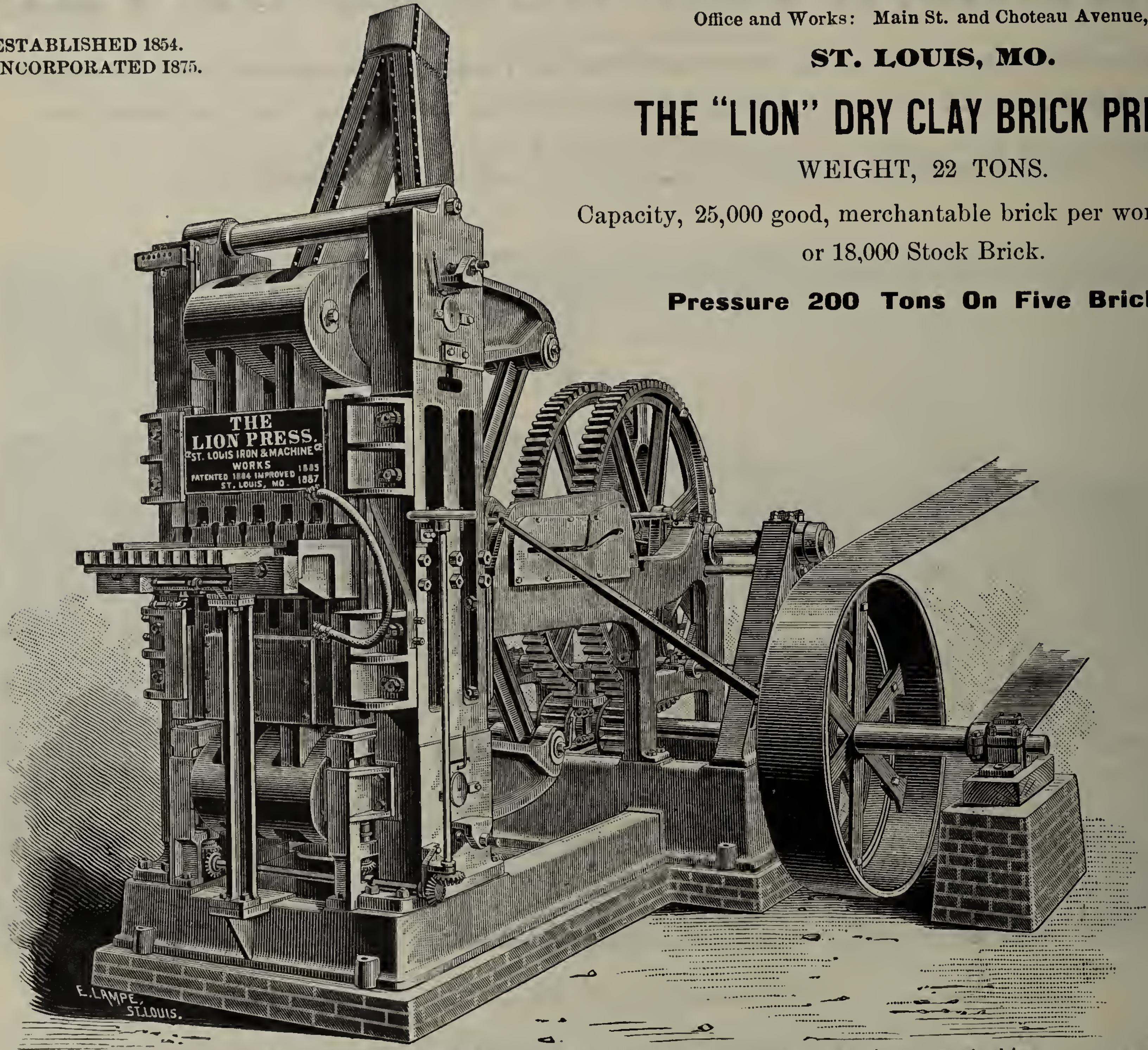
Office and Works: Main St. and Choteau Avenue,
ST. LOUIS, MO.

THE "LION" DRY CLAY BRICK PRESS.

WEIGHT, 22 TONS.

Capacity, 25,000 good, merchantable brick per working day, or 18,000 Stock Brick.

Pressure 200 Tons On Five Bricks.


THE
LION PRESS.
ST. LOUIS IRON & MACHINE Co.
WORKS
PATENTED 1884 IMPROVED 1885 1887
ST. LOUIS, MO.
E. LAMPE,
ST. LOUIS.

We claim the following essential features and advantages for our Machine:

1. The main feature of this machine is its great strength, power and durability. The pressure on each brick being 40 tons, and the working parts are so strongly constructed that there is no spring or give under this working strain. 2. The great simplicity and openness of framing and construction, so that every part of the machine is easily accessible for inspection, lubrication and adjustment, thereby reducing the necessary repairs, incidental to every Brick Press, to a minimum. 3. Pressing 5 bricks at each revolution of Machine, keeps the regular force of off-bearers and setters fully employed, which a 4 Brick Machine cannot do. 4. The adjustment of machine from common to stock brick and vice-versa, can be made in a few minutes' time.

Besides the Press, we manufacture and furnish a complete set of clay preparing Machinery, Elevators, Mixers, and Rollers; also Engines and Boilers complete. We also build different kinds of Steamboat Machinery and Steam Boilers, Corliss Engines, Cotton Compresses, Water Work Plants, Coal and Mineral Mining Machinery, Bridges Work, Hoisting Travelers, Cranes and Elevators; also general and large castings and Machinery. Any further information cheerfully given.

TESTIMONIALS.

St. Louis Iron and Machine Works, St. Louis, Mo. KANSAS CITY, MO., September 28, 1888.

GENTS: The two "Lion" Presses I bought from you about two years ago have given me entire satisfaction. As a dry clay press I think they have no superior. I prefer the "Lion" to the "Hydraulic". Ever wishing you success with the "Lion," I am,

Very Truly Yours, DRURY UNDERWOOD.

OFFICE OF
TENNESSEE BRICK MANUFACTURING CO.,
NO. 7 MADISON STREET, MEMPHIS, TENN., September 28, 1888.

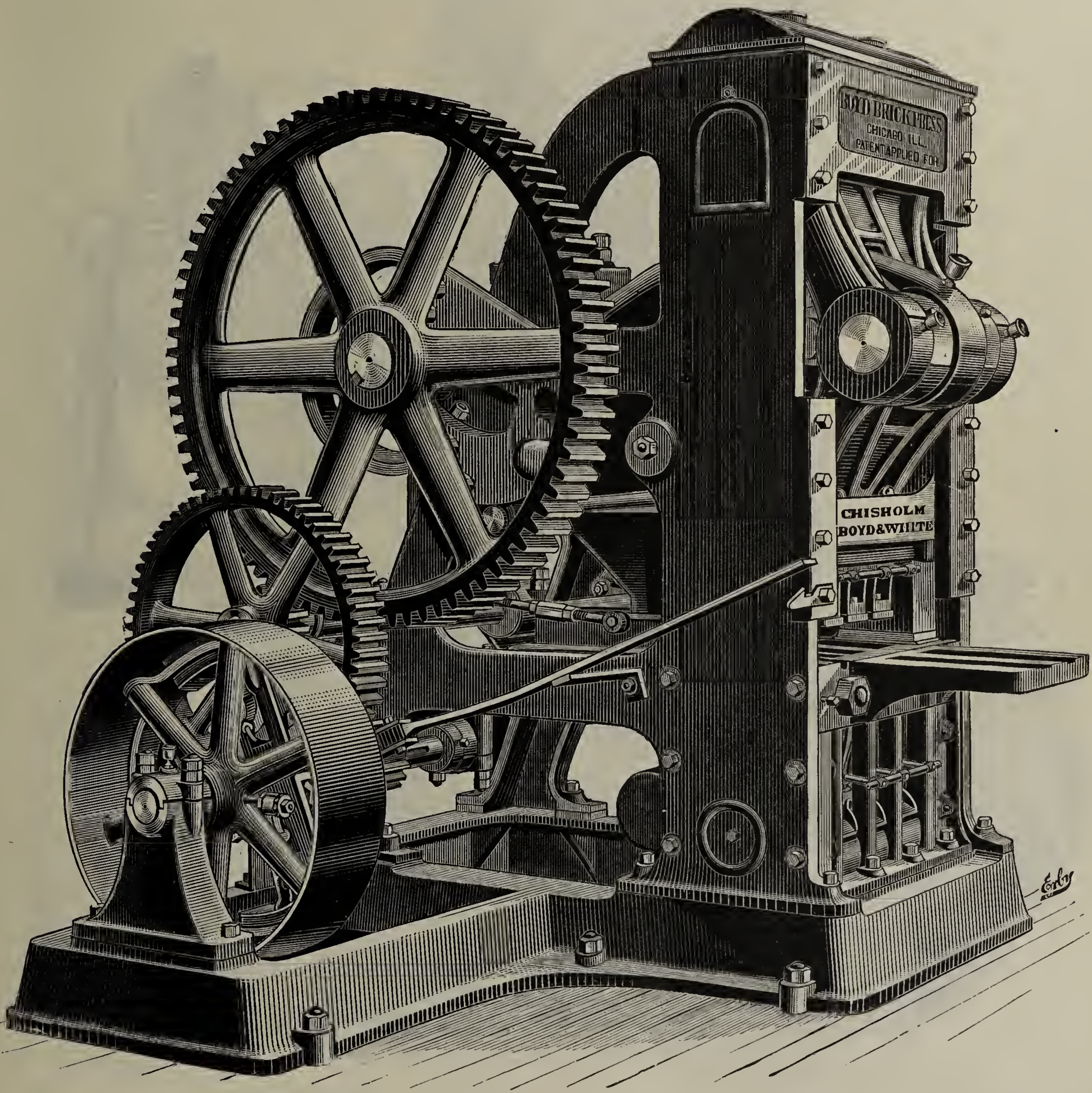
St. Louis Iron and Machine Works, St. Louis, Mo.

GENTLEMEN: In reply to yours of 25th inst., we beg to say that our Company contracted with you last spring for one of your "Lion" Brick Machines, having concluded, after our President and Superintendent had thoroughly investigated most of other machines, including the Hydraulic, that yours possessed more advantages and promised better results. In due course the machine was delivered, set up and put into operation. After having operated it all summer to full capacity, we are more than pleased with results and can heartily recommend the Machine to any one contemplating a purchase. To fully appreciate the merits it must be seen performing work.

Wishing you that eminent success which you so well merit we remain Yours Truly, C W. EDMONDS, Sec. and Treas.

THE BOYD BRICK PRESS

Will make a greater quantity of Perfect Brick (of maximum weight) per mould for a consecutive number of days than any other Semi-Dry Brick Press in the world and Superior in Quality to Hydraulic Pressed Brick.

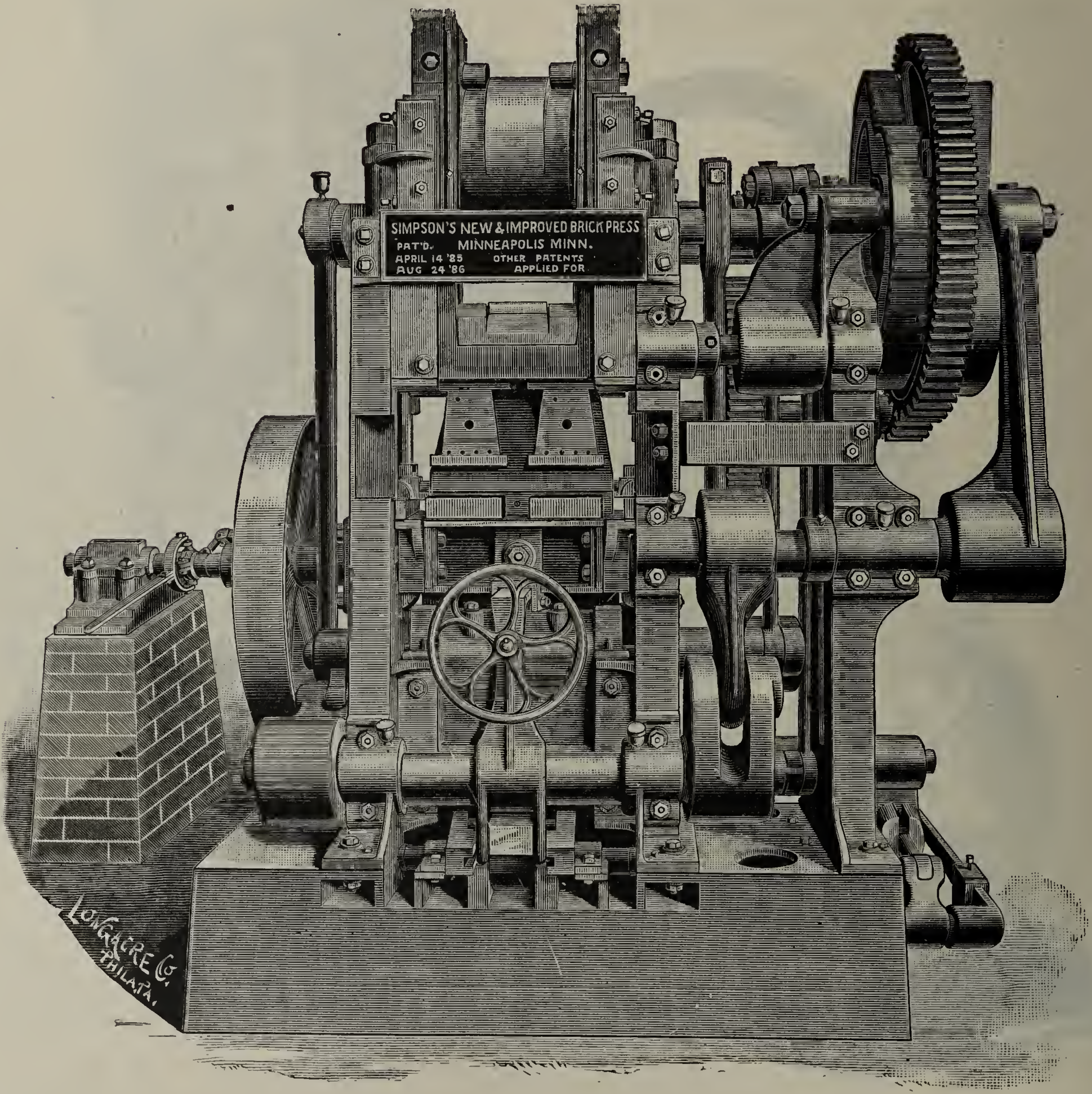


☞ Correspondence Solicited.

CHISHOLM, BOYD & WHITE,

86 Adams Express Building, CHICAGO, ILL.

SIMPSON'S NEW
AND
IMPROVED BRICK PRESS.



Send for particulars and prices

SIMPSON BRICK PRESS CO.,

Room 91, No. 159 La Salle St., CHICAGO. ILL.

The Brewis Patented Brick Press.

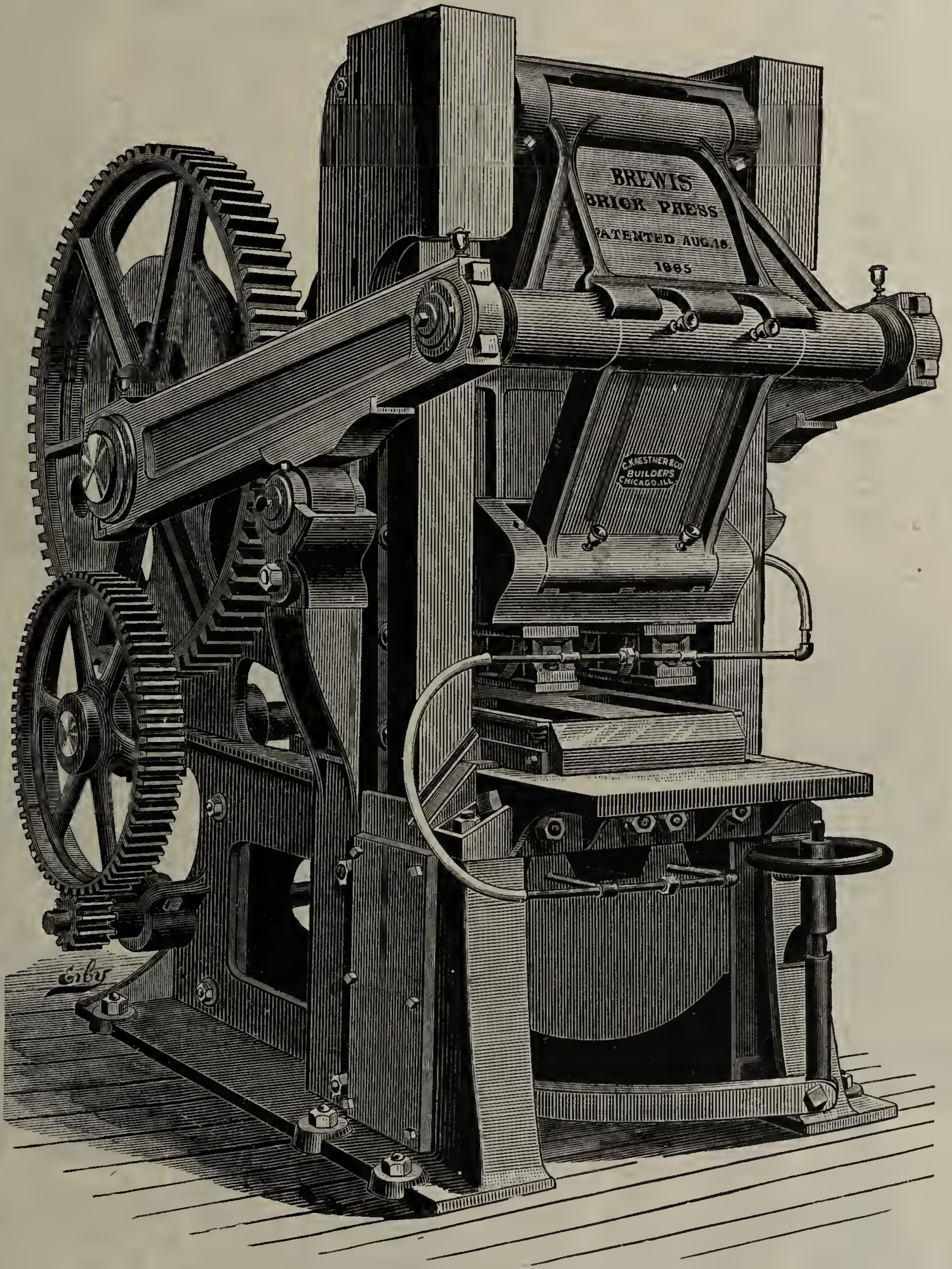
SIMPLE AND DURABLE.

Guaranteed to make as many Perfect Brick per mould as can be made on any machine now in the market. We except none.

Fully covered by patents. **We protect our purchasers**

Capacity 8,000 to 16,000 a day depending upon the clay

Shipped to responsible parties on 30 to 60 days trial.



Guaranteed against breakage for Two Years.

We furnish the Boyd and Raymond Pulverizers at prices that defy competition. Send for Circulars and Prices to

CHARLES KAESTNER & CO., Machinists and Founders,

ENGINES, BOILERS, PUMPS, SHAFTING, PULLEYS, HANGERS, ETC.,

[Mention the Clay-Worker.] **303-311 South Canal Street, CHICAGO, ILL.**

Improved Eureka Dry Press Brick Machine.

WEIGHT SEVENTEEN TONS.

Capacity 25,000 bricks per day. Simple, powerful, most durable, and superior to any dry-press machine in the market.

Awarded highest premium over all competitors at World's Exposition of New Orleans, La., and the Great Southern Exposition of Louisville, Ky.

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EUREKA BRICK MACHINE MANUFACTURNIG CO.

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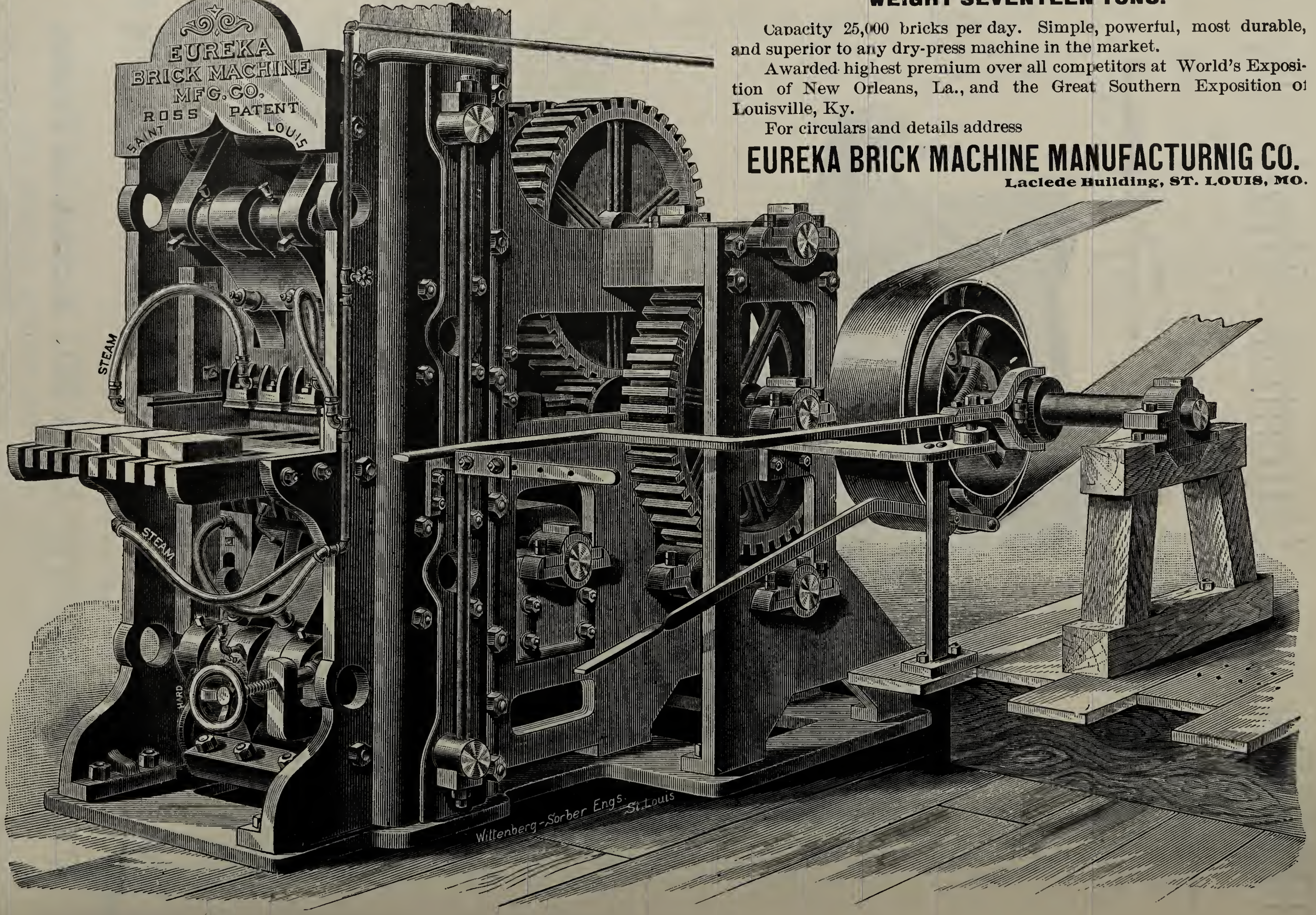
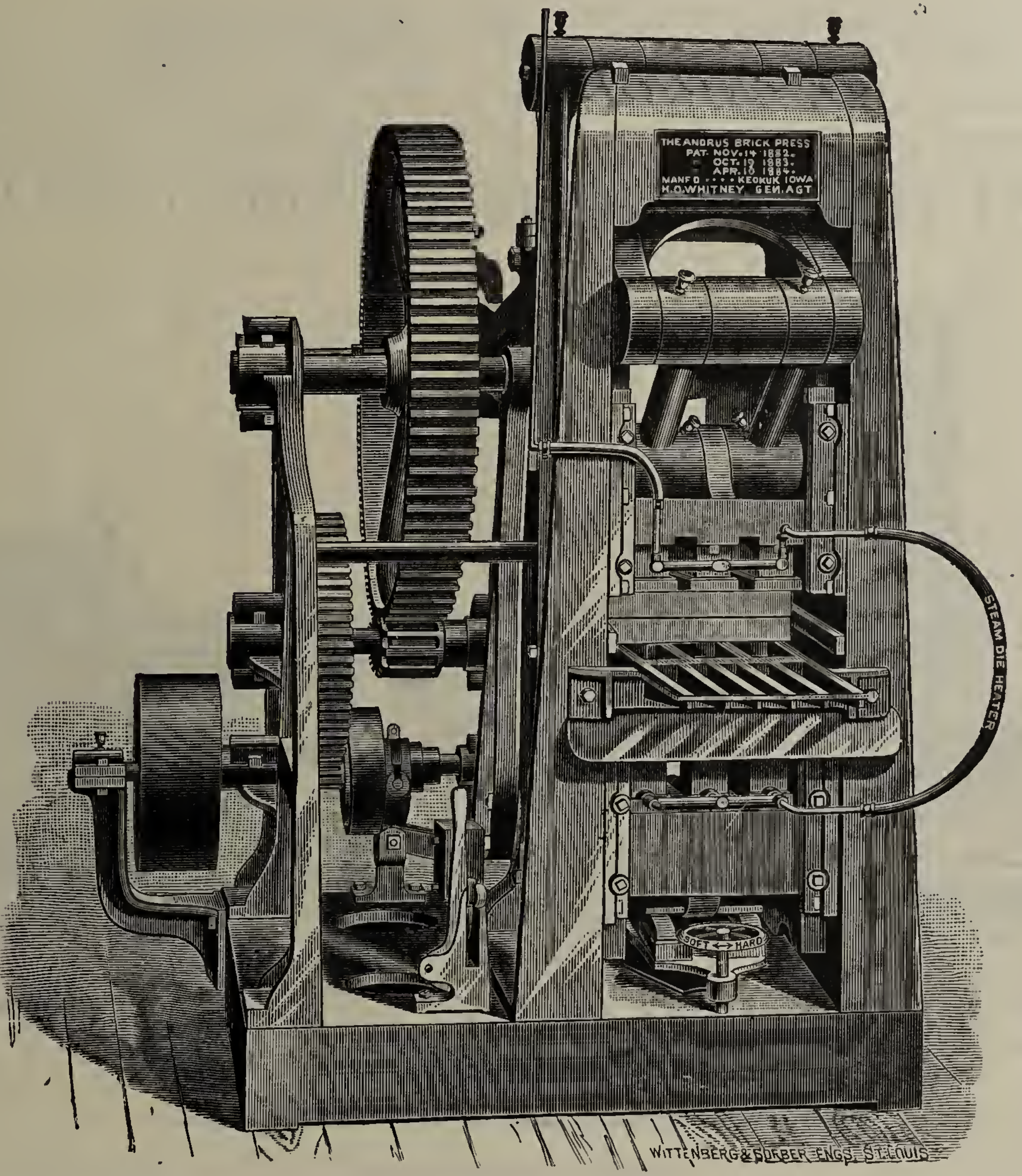


THE

Improved Andrus Double Pressure Brick Press.

UNRIVALLED FOR SIMPLICITY, POWER AND DURABILITY.



The Pressed Brick made on the Andrus Machine have been tested by the U. S. Government and adopted for fronts in Government Buildings.

Built at our OWN FACTORY with heavy forged STEEL pressure arms and fully guaranteed against breakage. Not an experiment but a TRIED and PROVEN success.

60 machines in successful operation the past season. Examine it before purchasing.

Ittner Bros., St Louis, Mo., using the Andrus Presses produced 36 large kilns of brick of unsurpassed quality the past summer.

Samuel J. Rose & Son, Chester, Pa., and many others have made a splendid success.

The Andrus Press, Clay Crushers and Pulverizers can be seen in operation at all times at Our Factory.

Send for descriptive circular and reference, address

H. O. WHITNEY, Gen'l Agent,

General Office and Factory, KEOKUK, IA. (Mention the Clay-Worker.) KEOKUK, IOWA.

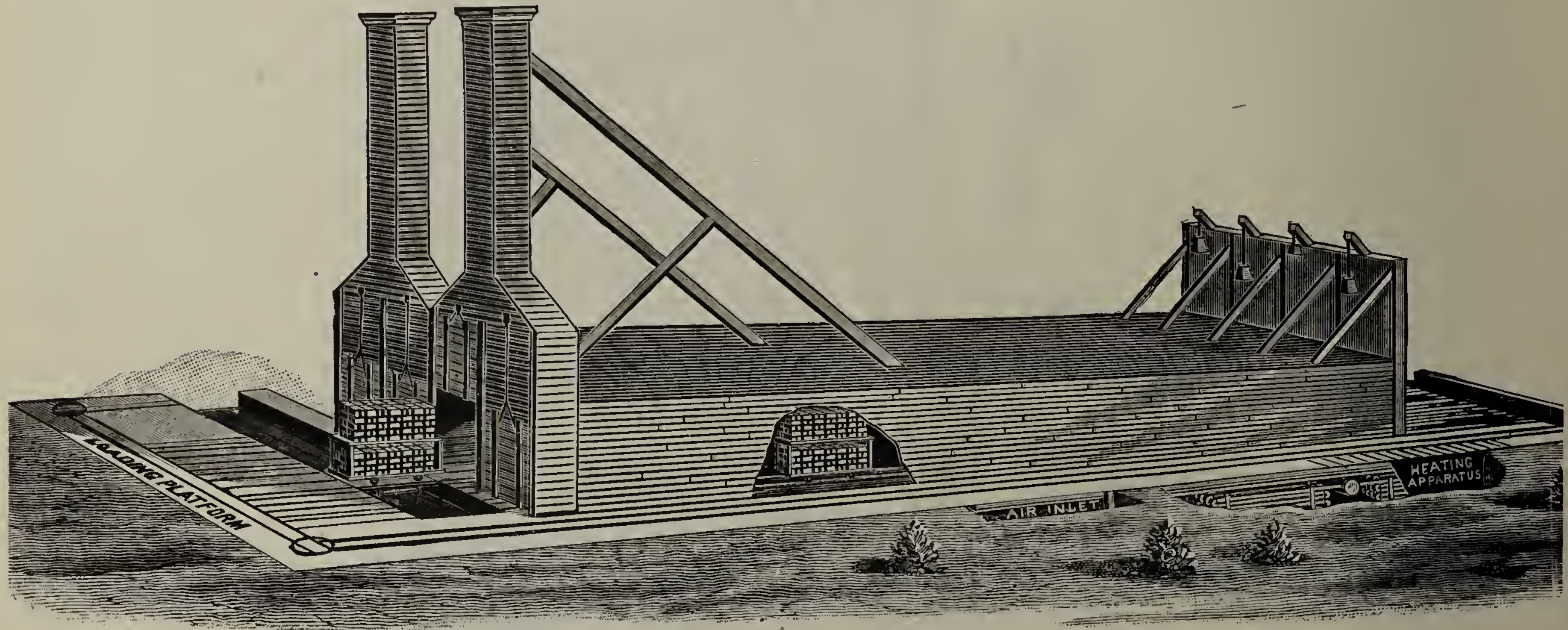
BRICK DRYERS.

We are prepared to erect Dryers to dry any clay.

YOU SAVE EXPENSE OF SHEDS. . . . .
. . . . YOU WORK DURING ENTIRE YEAR. . . .
YOU SAVE TIME AND FUEL IN WATER SMOKING

NO FROZEN BRICK. . . . .
. . NO INTERUPTIONS BY RAINY WEATHER .
NO DELAYS BY WAITING FOR DRY BRICK . .

WOOD BUILDINGS CHEAP TO CONSTRUCT



CHICAGO IRON-CLAD DRYER,

FOR ALL KINDS OF BRICK AND TILE.

This Dry House is a combination of the Drying Floor and Tunnel System. The radiation from the Iron Floor extending over the heating coils dries the lower tiers of bricks. The perforation of the Iron Floor gives an even distribution of the heat and prevents cracking. The steam heat is not so intense as to melt down the bricks or bake them. The bricks are dried smoothly and burn evenly, with a good ring. The water smoke is drawn off as rapidly as made, and the drying is even and gradual. Stiff mud bricks are hacked on double-decked cars. Soft mud bricks are dumped on pallets and cars carry the same through Dryer. Semi-dry and dry pressed bricks are specially provided for and can be dried without injury. Our buildings are constructed entirely of wood; are simple, cheap and easily erected. We furnish complete steam heating apparatus with pipes connections, Iron Cars, Turn Tables, Transfer Cars and Rails. Confer with us before contracting elsewhere. We will save you money, time and trouble. State character of bricks made, name of machine used and capacity required.

I. & M. WOLFF & COLEMAN,

PATENTEES AND SOLE BUILDERS,

Write for catalogue.

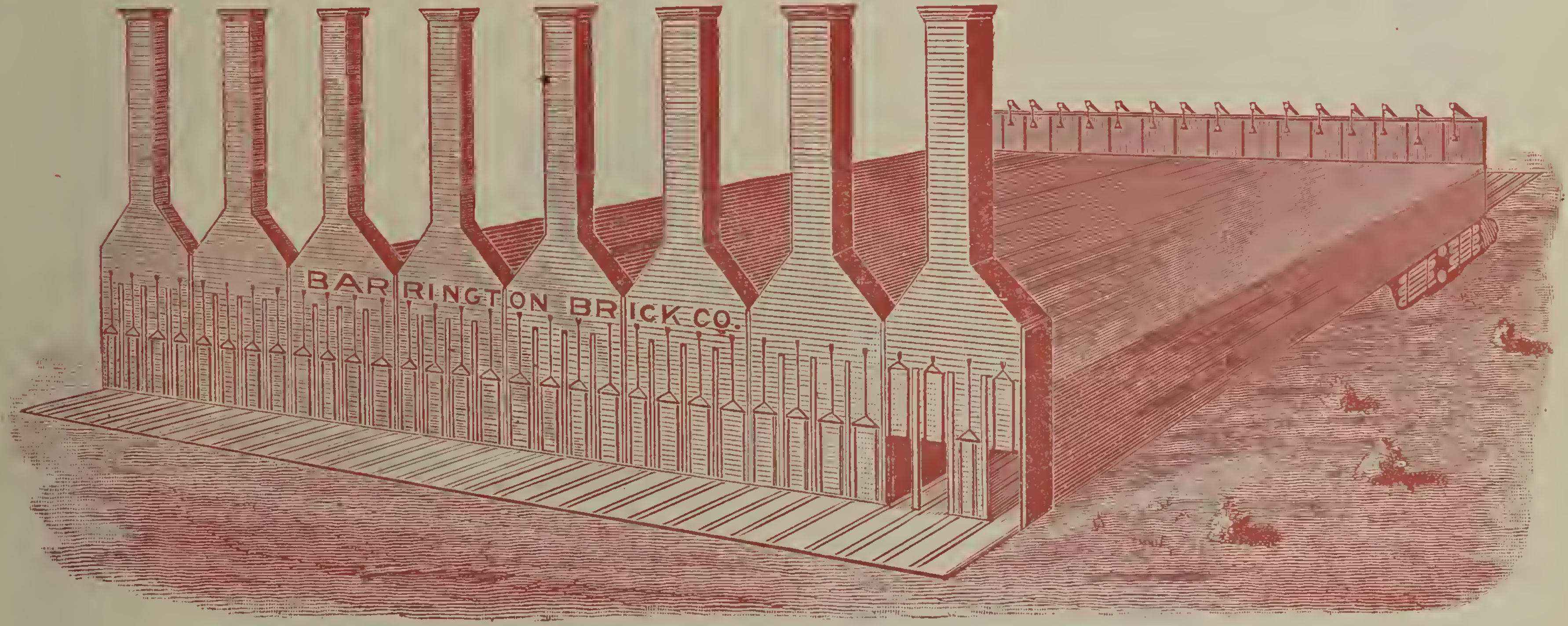
No. 261 Dearborn St., Chicago, Ills.

THE ✻ IRON ✻ CLAD ✻ DRYER.

DRYING

75,000 BRICK PER DAY,

AT BARRINGTON, R. I.


BARRINGTON BRICK CO.

The above is a view of the Chicago Iron Clad Dryer as erected by the Barrington Brick Co. at Barrington, R. I. They are now successfully drying 75,000 brick a day to their entire satisfaction.

Address

I. & M. WOLFF & COLEMAN,

261 Dearborn Street, - - 14 Third Avenue,

CHICAGO, ILLS.

Mention Clay-Worker. Write for full description of dryer, prices, etc.

DRYING SOFT MUD BRICK.

Baltimore, August 15th, 1889.

I. & M. Wolff & Coleman,

Dear Sirs—The "Iron Clad" three tunnel brick dryer you finished for us a few days ago is now running. We have taken out the last three days an average of 25,000 brick dryed as nicely as we could wish.

I believe this dryer will show considerably greater when longer in use. With many wishes for your success with the "Iron Clad," as I believe it to be the best dryer now offered to the trade, I remain,

Respectfully Yours, P. G. Zouck, Gen'l Manager
South Baltimore Brick and Tile Co.

For further information and particulars address

I. & M. WOLFF & COLEMAN,
261 DEARBORN ST. AND 14 THIRD AVE.,
CHICAGO, ILLINOIS

THE CLAY-WORKER

VOL. XII. INDIANAPOLIS, IND., SEPTEMBER, 1889. No. 3.

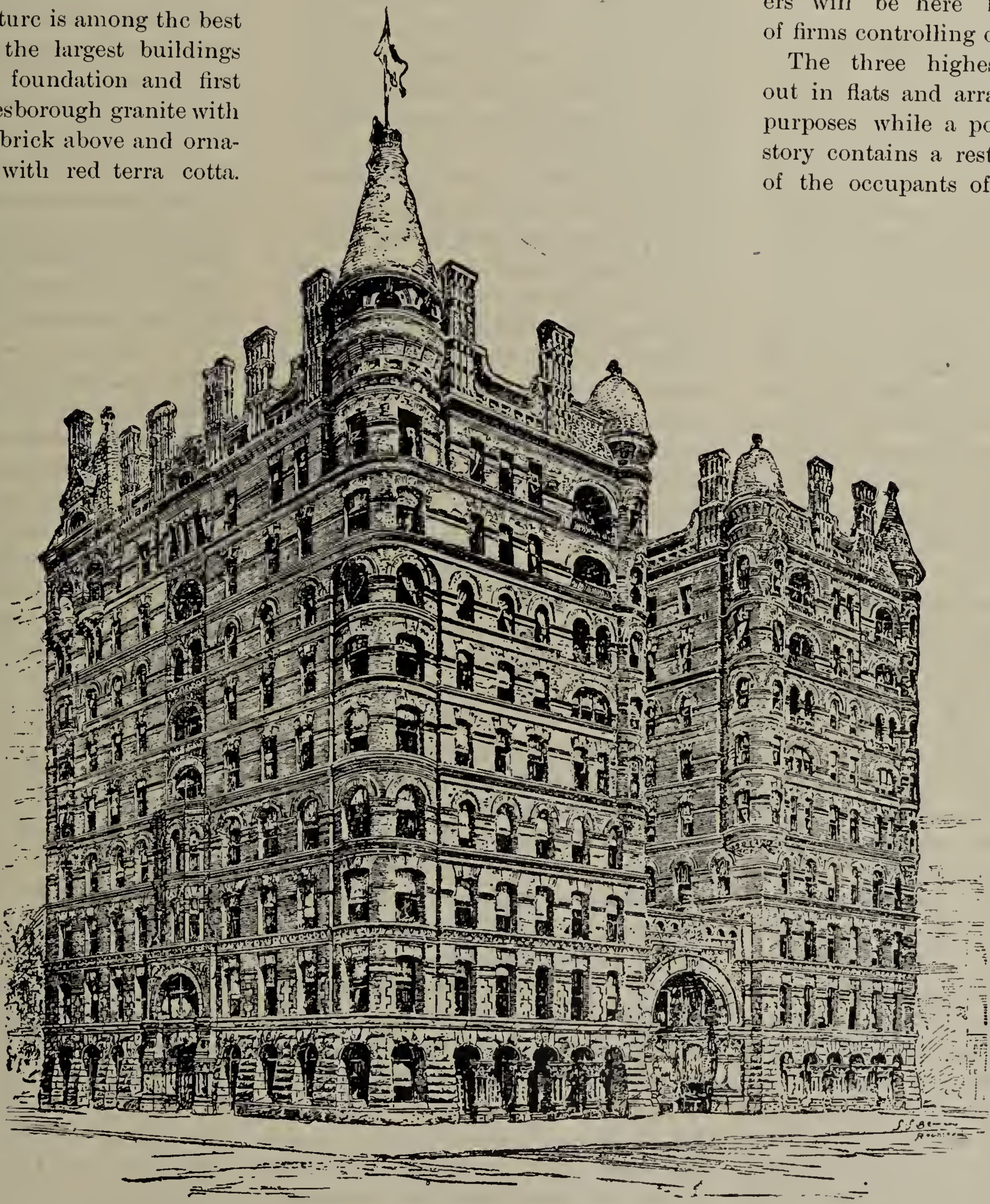
Written for the Clay-Worker.

EXAMPLES OF AMERICAN BRICK AND TERRA COTTA WORK.

No. 19.

THE PULLMAN PALACE CAR OFFICE BUILDING.

This great structure is among the best known as well as the largest buildings in Chicago. The foundation and first story is of red Jonesborough granite with St. Louis pressed brick above and ornamented liberally with red terra cotta. A belt course of this material above the second story produces one of the finest effects and possesses an artistic richness that is unsurpassed. The building measures 127 x 170 feet and is ten stories in height or one hundred and sixty-five feet to the corner tower. It is thoroughly fireproof in construction, all the floors, ceilings, girders, columns, etc., being covered with fireproof tile, the partitions throughout the structure are built of hollow tile giving a light but thoroughly substantial division to the interior at a vast reduction in expense as well as economy of room. The main staircase is of marble and five elevators operate for the use of passengers and the carrying of freight. The steam heating, ventilating and drainage is upon an improved plan—The Durham system of Iron house drainage—the practical advantages of which have been satisfactorily tested at the city of Pullman. In all other sanitary points the building is as perfect in construction and appointments as the best builder this age of advanced knowledge in building economy can supply. Besides containing the general offices of Pullman's Palace Car Company both of this country and abroad the American headquarters will be here located and offices of firms controlling other large interests.



PULLMAN BUILDING, CHICAGO.—*S. S. Beman, Architect.*

The three highest stories are laid out in flats and arranged for domestic purposes while a portion of the ninth story contains a restaurant for the use of the occupants of the building.

SUCCESSFUL advertising is an art, and one that is being more highly developed each day. It is an art requiring not only an artist, but a positive genius. Any printer may set an ad. that will look neat, harmonious and give evidence of the experienced workman, but few are capable of originating a distinctively new and attractive announcement. Leading mercantile houses, more particularly in the retail trades, pay high, and apparently excessive salaries to individuals who are capable of evolving novel and practical ideas of value in bringing their wares before the public in such a manner as to at once gain their interest and attention.

These fresh, breezy advertisements are

not by any means the least interesting and valuable points of a live, wide-awake journal. Some publishers regard advertisements as a necessary evil, hoping to see the time when the profits of the paper would enable them to dispense with such patronage. Why so? Advertisements are news. They tell the reader what is for sale, the price, also where purchases should be made. The editor and correspondent do not furnish all that is interesting. The skillful advertiser, by his way of putting things and calling attention to his goods, does much to make a journal valuable and interesting.—*Typographic Messenger.*

Written for the Clay-Worker.

BRICKMAKING AND BURNING.

No. 6.

BY J. W. CRARY, SR.

A NOTABLE EXPERIENCE.

If the readers will look carefully over the five articles I have written for the Clay-Worker, beginning with the April number, he will get enough information to enable him to form a very correct idea of clays, brickmaking, setting and burning. These articles give a very general description and theory of the art, and if any intelligent man of good practical judgment, with an inventive, inquiring mind, and an energetic, patient industry and perseverance, will follow the suggestions and directions given in the articles, he will be able to judge and decide, all the main questions preparatory to the establishment of brickmaking.

After all the preliminaries have been decided upon, the next important thing, is to get the services of the very best and most skillful, practical brickmaker. Right here, I will indulge in a little episode of my own life, but the reader will justify my egotism for the value of the lesson. In 1855, a wealthy company here in Florida, undertook to make 65,000,000 of brick for the different U. S. fortifications on the coast of Florida. Not one of this company had any practical knowledge of brickmaking, but they had plenty of money, slaves and credit. They were, however, as cautious and capable as most men of the country and secured advice and services of the best native brickmaker they could get. He told them of suitable locations, they paid $10,000 for one, and employed this brickmaker to superintend the practical part of the business. He had made and burned brick before on the same place, and they thought they had a "sure thing," but there was a "Lion in the Path."

The U. S. contracted for "best whole hard brick," and there was an officer on the U. S. Works that knew a brick when he saw it. The company dashed ahead and soon had a kiln burned, and although a good kiln for building purposes, not ten per cent. of it would bear government inspection. The company had to go into the brick market, and pay a high price for brick to supply their contract; but they had pluck and determined to succeed making the brick. They worked two years, spent $75,000 and did not make 50,000 brick acceptable to the government. Then they abandoned the place, bought another at the cost of $10,000 in the same locality, employed the same brickmaker, and again failed to make and burn brick to suit the contract. The company employed other brick burners, the best they could find with very little better success. They became discouraged, and were about to pocket their loss and quit, when accidentally they were told that I, then living in New Orleans, made a specialty of burning brick for U. S. work, and if they could get my services at any price, they would do well. Now to make a long story short, I took charge of this company's establishment in 1857. 16,000,000 of brick, about 95 per cent. of all we made, went to the government before the war commenced. I got my own price for my services and had my own way. The company recovered their losses and made money.

As I have said in these articles, the art of clay working is the oldest, and has fewer real experts than any other, save what we call "fine arts" and it is no disparagement to these, to say, that a perfect clay worker is an artist of no mean order.

On all three notable occasions, at different times and places, I have made first class brick in large quantities for the U. S. government, when all efforts of others, who had the same or greater facilities, utterly failed to compete. I cannot tell any man just how he can perfectly burn a kiln of brick, no more than an expert painter can tell another painter, just how to naturalize, or imitate the object he desires to paint. I rarely manipulate the burning of kilns alike. Weather, fuel, clay and conditions all these things, are to be noted and considered. The man who burns brick in a given time, with a given quantity of fuel, never was and never will be a first-class burner. He must fire his kiln right, and fire until it is thoroughly burned. He must have varied and repeated practice, and with all, and above all, a keen analytical and discriminating judgment.

HOW TO TOUGHEN OR ANNEAL BRICK WHILE BURNING.

In some of my former articles, I have said that the art of burning brick, or anything of clay, is very much like that of working and tempering metals. If, for instance, it is desired to make cast iron very hard and brittle, it is cast in a cold iron mold, or chill, so that it will cool quick. If it is to be made soft and tough, it is cast in sand, and the air kept from it as much as possible, until it becomes cool. So in like manner, clay may be made very brittle or it may be made hard and tough, so that it will stand great pressure, or may be cut to a sharp edge or angle, without flaws or fracture. I have annealed brick made of strong clay, silicate of alumina, so that a brick 9 by 4⅜ by 2½ inches, carried on the flat, the enormous weight or pressure of 250,000 pounds, without crushing. Out of twenty samples of brick from different parts of the country, North and South, only five brick stood 130,000 pounds.

TO ANNEAL A KILN OF BRICK.

The watersmoke should be carried off slow and steady, then the heat should be gradually increased, until the overhangers are as hot as they will stand without drooping. This heat should be kept steady until it can be seen all over the kiln, then the spots on top of kiln, showing the same heat of the arches, and the edges of the platting showing a dark or copper-colored sulphuret, should be closed tight with fine clay, and as fast as these spots appear, cover them over tight until the whole kiln be covered, except the margins, say eight inches from heads and outsides. The kiln is now perfectly burned, and should be closed tight and kept so, until a brick can be taken out from the top without burning the fingers. Then the arches may be opened, and a good strong brick, with uniform hardness and color throughout the kiln, is the certain result, excepting the outside course and one course on top the kiln. The idea of trying to work the fires in the arches so as to burn out slack, or cold places on top, is folly, and a loss of time and fuel as well as a damaging exposure of the brick to the air, when the fires are unequal in the arches. From the time the arches are at the maximum heat. until the kiln be closed, our arch should be kept at the same uniform heat. There is no possible way to work the fire out on the top, with uniform certainty only by covering as before stated. As the kiln is covered, the draft is forced to the uncovered parts, and the combustion of fuel, when the kiln is covered, very little fuel will keep the arches as hot as they will heat and the danger to melt is at the same time diminished and the heat throughout the kiln is equalized. I got a patent for this process in 1856, together with other features, and I have never failed at any time, or place, or in any kind of clay, or with any kind of fuel, to make a perfect burn. Platting may be closed on burnt out places, but it is not as good as fine clay to work the fire, and clay don't hurt the color of brick, if shoveled off clean with platting, which should be brick bats. I prefer to "plat" with one course of bats, then as the sulphur shows up on edges of platting, and a place begins to "settle," (if the clay will settle,) I cover the spot with fine damp clay, about three-quarters of an inch thick, so as to stop the draft of heat from that place. This prevents an excess of heat at that point, and saves it for a colder place, and so the process of covering goes on until the whole kiln be covered.

The best way to "*damper*," or cover a kiln is to have a small scaffold near the top of the kiln, put up a ladder, and two hands will carry clay up in buckets or sacks, as fast as an expert will put it on the places to be covered.

He will not suffer from the heat or even burn his shoes if he will just drop a little clay, where it is very hot, to step on. When he "dumps" his clay on a place to be covered he should spread it with his foot, treading it a little to make it tight.

When the kiln gets cold and ready to open, let a careful hand take a good, straight-edged shovel, and run it under the bats and clay and throw it off; little or no dirt will fall down into the kiln. It takes no extra labor to "damper" a kiln on top, and it makes a perfectly burned, strong brick.

[Copyrighted].

A number of potters are now using electricity for the purification of kaolin and other porcelain clays. The clay is sifted on to the horizontal plates surrounded by powerful electro-magnets, which retain all particles of iron. By this process many clays which have hitherto been rejected as containing too much iron are now used advantageously.

Written for the Clay-Worker.

SEWER PIPES AND THEIR MANUFACTURE.

BY ALFRED CROSSLEY.

[CONTINUED.]

In 1844, Edwin E. Cassell described the manufacture of composition pipes, when oil, tar, or vegetable naptha was mixed with other materials; and in some of the mixtures rosin, vegetable pitch, and sulphur were used. The pipes were formed in moulds and were of an elastic nature.

In 1845, Freeman Roe obtained letters patent in connection with the manufacture of glass pipes, and three different modes are described of joining these pipes, (1) by means of unions and cement, (2) by metal collars screwed together, (3) by forming threads on the glass. All the fittings such as branches, offsets, and bends were made and jointed similar to the straight pipes. It was claimed as one of the advantages that the glass pipes could be made cheaper than iron, in consequence of the removal (in England) of the duty on glass.

In 1851 and '52 the Earl of Dundonald received letters patent for "Improvements in the construction and manufacture of sewers, drains, waterways, pipes, reservoirs, and receptacles for liquids or solids, from a substance never heretofore employed for such manufactures." The "substance" alluded to was bitumen, and it was used for making pipes, and rolled into slabs, it was mixed with oils, etc., to alter the consistency and to soften it. In this connection, it is refreshing to find that now and then an English Earl devotes his attention to an effort to invent something for the benefit of his race, even though as usual his distant plebeian relative heads off his invention with something of more practical value.

In 1852, Mr. Jennings described the making of continuous concrete drains. When the drain track was cut, a layer of concrete was thrown into the bottom of the track, and a core was applied to form a hollow in the concrete, and more concrete was placed on the top of the core, all firmly beaten down; then the core was drawn forward, and the operations continued until the whole drain was formed in the middle of a continuous block of granite.

In 1854 we have probably the first account of the manufacture of drain pipes from slag. This was by Messrs. Smith, Bessemer & Langdon. The slag was run from the blast furnace into melting pots of fine clay, refined and then poured into moulds.

In 1857, glass as a material is again brought under notice, when Messrs. Turner described the casting of hard block glass into the form of pipes.

Under date of 1860 we have an account of the manufacture of paper pipes. Various patterns of pipes are described, jointed with spigot and faucet, coupling pieces, or screws. Bituminous mastic prepared from the products of gas distillation was used with the paper, and considerable pressure was used in the manufacture and shaping of the pipes and other articles.

In 1863 a gentleman described the manufacture of drain pipes of peat moss, and I suppose this gentleman reached one of the extremities of folly that brainless inventors sometimes get to.

The history of the subject embraces many other inventions and devices, for which patents were granted, all more or less interesting, but which some regard to brevity compels me to pass over. These inventions no doubt cost their authors many a sleepless night and the expenditure of a good deal of money, but they are now known only as matters of history, and for all practical purposes in the manufacture of sewer pipes we are left to the most abundant of all natural materials, clay, which when of proper quality and rightly manipulated, is superior to any other known substance, all things being considered. The sewer pipe body bears the nearest analogy to stoneware, we may say it is in fact a coarse stoneware.

Nothing is definitely known of the origin of stoneware. It was made in Germany, Holland, and Flanders, over 500 years ago, and was first made in England in the seventeenth century. It was originally glazed with galena or sulphide of lead. The discovery was made in England of the art of glazing with common salt. This is said to have been the result of an accident. In 1680 a maid servant on a farm near to Burslem, Staffordshire, through negligence allowed a pot of salt lye which she had on the fire to boil over, the sides of the pot became red hot and when the pot became cold it was found to be covered with an an excellent vitrious glaze. The circumstance was reported to the neighboring potters, who at once began to make use of it, and the new "salt glaze" soon to a great extent superseded the lead glaze hitherto in use. The salt makes a perfect glaze, which, unlike leads, resists the action of acids, all except floric. It was not till about 60 years ago that its great value in this respect was recognized, and from which time the modern manufacture of salt glazed stoneware sewer pipe practically dates.

Before discussing the question of the kinds and varieties of clay most suitable for sewer pipes, it is necessary to know what are the qualities or characteristics required in the finished article, and to a proper understanding of this we must give some consideration of the purposes to which they are to be applied, or in other words to the scope or province to which our pipe rightly belongs. Because the character of the raw material used should evidently be determined as to its suitability to meet the demands made upon it in actual use. It is to be regretted that this evidently rational view of the subject has been very often entirely lost sight of in the past.

The principal use and purpose of glazed earthenware pipes, to which our thoughts naturally revert, is that of conduits for sewage, and to which they were practically confined, until a comparatively recent date. The improvements in their manufacture and superior excellence of finish however show them to be eminently adapted for use as conduits of fresh water supply, as substitutes for iron, to which, wherever their use is practicable, they are very much superior. A third application, in the larger sizes only, is to the construction of culverts under railroads and country highways. This also is of somewhat recent date, and its superiority for this purpose over wood or stone is now undisputed. There are, besides, various other minor uses that might be mentioned, but the three I have named are the most important. The first two uses named call for the same characteristics or qualities in the pipe, and although working in two opposite lines of thought unite in the evolution of the same idea, viz.: that the pipes shall have the property of retaining perfectly their contents during the flow, whether of sewage or pure water, or in other words shall be absolutely impervious to moisture. In the case of the water works conduit it is imperatively necessary that the water shall be delivered fresh and pure as when received from the reservoir or source of supply, and hence the pipe shall be positively proof against absorption from the soil or ground in which it is laid. And in the case of sewer ways it is just as important that it be impossible for the impure sewage matter to percolate through the sides of the sewer. The soundness of these propositions is now so well understood and thoroughly recognized that I deem it unnecessary to go into any detailed argument to prove them. Another requisite in pipe for sewerage is that it shall be able to resist the action of acids contained in the sewage, and as I have before mentioned, this requirement is most fully met in a salt glaze, which is unaffected by any acid except floric. Another essential requisite in both a sewer and water pipe is, that it shall be of sufficient strength to resist a considerable pressure, either a bursting pressure from within or a crushing pressure from without. It should be the duty of inspecting engineers of sewerage and water works to see that all pipes used comply with this condition, and without fear or favor. How many cases of bursted mains and crushed sewers, often at a great depth in the ground and involving great expense in opening out and repairing could have been avoided by the conscientious examination of every pipe before it went in. It is very humiliating for a manufacturer to have any of his material rejected (I speak to some extent from experience), and on the other hand it is a painful duty for a right minded inspector to condemn a pipe that to the untrained eye is just as good as any other, but the construction of sewerage works is closely connected with the health and life of large communities and involves the large expenditure of public money, and these interests should be of the *first* consideration. Unfortunately the men placed in this important position are susceptible to bribery in too many case, and this is true on both sides of the Atlantic. My idea is that any man in such a position who is willing to "take a tip," as we say in England, or who says to the manufacturer "see me," as we say in America, compromises himself to say the least, and should be dismissed from the position, and branded, so that he can never get another similar appointment. Our sanitary engineers when designing public sewerage works should, in their specifications, demand a quality of pipe that meets the requirements of modern science. In regard to resistance to pressure I have not any record by me as to tests of internal pressure. The following table shows the strength of good, vitrified pipe to resist external pressure: (These tests were made by Mr. A. V. Abbott, Engineer, New York. A wooden box was made large enough to admit the pipe and allow from two to three inches of sand to be packed in at the sides, giving the pipe as nearly as possible, the position it would occupy when laid in the earth. The pressure was then put on top of the pipe, with the following results—average of two pieces each size—each piece being 24 inches long):

Diameter.	Thickness.	Crushed at
18 in.	1½ in.	14,233 pounds.
15 "	1¼ "	24,030 "
12 "	1 "	11,540 "
6 "	⅞ "	28,065 "

What then is our ideal sewer and water works pipe? A pipe of dense, sound body, capable of enduring heavy pressure, so far vitrified throughout as to render it impervious to moisture independent of any glaze, but likewise well and thoroughly glazed inside and outside (but especially inside) with a good salt glaze. I am now speaking of the pipe itself, of the mechanical details I will speak later. I have spoken of a third use or purpose of sewer pipe, viz., for culverts. For this purpose we can be less rigid in our requirements. Being used only as ducts for overflows, or for small branches of creeks, it is sufficient if it be sound and strong, hard, and fairly well glazed. On account of its use in railway embankments and hence subject to heavy pressure, it is made extra thick, called "double-strength," it is made a specialty of, chiefly by St. Louis manufacturers.

It is needless to remark that there is a radical difference between sewer pipes and agricultural or common drain tiles, and yet it is astonishing how much ignorance there is even among intelligent people as to any distinction between them. I have heard many people speak of both under the generic name of "tile," and when asked which they meant betrayed a lamentable ignorance on the subject.

Coming now to speak of clays suitable for sewer pipe making, we may remark a similar ignorance on that subject. Many people seem to have an idea that almost any clay will do for that purpose, and in scarcely anything can they be more mistaken. I have already described the principal characteristics of a good sewer pipe body, and from that we can easily determine what we want our clay to be. We want a clay of good strong body, that will not crack or twist in drying and burning, of only moderate shrinkage or contraction, that will stand up in the kiln under a heat sufficient to give a good salt glaze, that will vitrify and take a good glaze at that heat, and that will not "air-shake" or "air-crack" with reasonable care in cooling. Do we find any clays that themselves combine all those qualities? We certainly do, frequently. It sometimes happens though that where we do not find a clay like this right to our hand, a combination of two or more clays will sometimes give us the desired result. What kind of clay then makes a good sewer pipe, and possesses the features named? Generally speaking, a fire clay that is not a fire clay—if I may be allowed to use such a paradox—I mean by this a fire clay, that while possessing the elements of silica and alumina in something like proper proportion, contains oxide of iron and alkalies to such an extent as to render it unfit for use under a furnace heat, and is, in other word, what we call a "bastard" fire clay. A clay that will vitrify at a heat sufficient for salt glaze, which we require in a sewer pipe clay, cannot be a true fire clay and should not be classed as such. But if for convenience we must still call them all fire clay, let us keep in mind a sharp distinction between impure fire clays that will vitrify at a comparatively low temperature, and pure (or comparatively pure) fire clays that will stand a very high heat without vitrification. Each of these classes has its appropriate sphere, and so long as kept to its proper use, will fill an honorable and useful place. The following are analyses of sewer pipe clays, Nos. 1 and 2 American and No. 3 English:

	No. 1	No. 2		No. 3
Silica	55.20	76.24		72.25
Alumina	31.02	16.87		18.08
Protoxide of Iron	1.90	.16	Perox.	8.57
Lime	.36	.50		.39
Magnesia	——	Trace		.02
Alkalies	2.07	1.09		.61
Water and loss	8.90	5.14		——
	99.45	100.00		99.92

(To be continued.)

RECIPE FOR PLASTERING OUTSIDE BRICK WALLS.

The following is a good recipe for plastering on the outside of a brick wall: Take of slaked lime 60 parts; sand, 35 parts; litharge, 3 parts; knead and work the ingredients into a stiff mass with 7 to 10 parts of linseed oil; use old oil or linseed oil varnish. It should be well worked to the consistency required and applied as other mortars, well troweled down. Or, sand, 90 parts; litharge, 5 parts; plaster of Paris, 5 parts, moistened and worked together with a small proportion of linseed oil. Oil the brick three coats before applying the cement, trowel down.—*Ex.*

PROGRESS IN BRICKMAKING.

BY PROF. R. T. BROWN.

This is the age of progress and improvement in all the useful arts. This progress is marked chiefly by improvements in two directions. The first is in the substitution of the inanimate forces of nature for the power of human muscles, and the second is in the displacement of handicraft by the application of mechanical contrivances in applying this power to useful purposes. In this march of the arts toward perfection, brickmaking was slow in starting, though it lays a just claim to seniority among the arts of civilization. The history of this art at different periods, and among different nations, is a curious and instructive one, but it is not our purpose to enter that field at present.

The nineteenth century will be notable in the coming ages as the birthday of great discoveries in the field of science and of inventions in the useful arts, but nearly half the century was past before the ancient art of brickmaking felt the impulse of the age. In the colonial days of this country, ordinary buildings were made of wood, though the better class of edifices were constructed with stone either dressed or in rough masonry. The early brick buildings in the eastern, seaboard cities were built of imported brick brought over the ocean in ships as ballast. These imported bricks are smaller than those now in use in this country and generally, somewhat paler than the fashionable color, but they are burned very hard and appear to defy the tooth of time. The bricks in buildings noted by Wm. Penn, in Philadelphia were imported and they are sound as when laid in the wall. Those who visit Mount Vernon may inspect a sample of imported bricks in the stables built by Gen. Washington after the close of the Revolution.

In other countries the use of adobes, or sun-dried bricks appear to have preceded burned bricks as a building material, but in this country and in England, they never came into general use. This was probably, owing to the dampness of the climate in the first instance, and to the general quality of the clay, in the second. Hon. Henry S. Elsworth, about the year 1845, in his report as Commissioner of Patent, recommends unburned bricks as a cheap building material for cottages and farm houses. He recommends the bricks to be made 12 inches long, 6 inches wide and 4 inches thick, and laid on stone foundations, in English bond, that is, alternate courses of headers and stretchers. His recommendation is based on experiments made at Washington where the clay is peculiar. Cuts made through beds of this clay will stand, in a nearly perpendicular wall, exposed for years without crumbling. Such a clay would do all that Mr. Elsworth claims for an adobe wall, but such a clay is rarely found west of the Alleghany mountains. Nearly all our clays contain, in minute quantities, what is known in technical language as *delequesent salts* which attract moisture from the atmosphere in sufficient quantities to soften the sun-dried clay even when it is protected from the direct contact of water. About 1850, however, the government experimented with a few adobe buildings at Fort Benton, on the suggestion of Mr. Elsworth. We examined one of these buildings, the last summer. It is still in a fair state of preservation, though in a few places the walls had been patched with more modern material.

In New Mexico and Arizona, both the climate and the nature of the clay, conspire to render the sun-dried bricks cheap and durable. Even in this climate, the durability of adobe walls may be greatly improved by covering them by a coat of plaster in which water lime is liberally mixed. But in our country, generally, bricks should be burned.

As we have already intimated, at the opening of the present century the art of brickmaking had made no advance in the last twenty centuries. The methods used and the character of the products were hardly superior to those of Assyria and Egypt and our brick certainly were not equal in quality to those of Rome in the Imperial age. Within the memory of those yet living the implements and appliances of a brick yard were of the rudest and most primitive character. The writer of these lines remembers, distinctly, passing the principal brick yard which supplied Cincinnati with building material in 1820, and watching the operation of tempering the clay with three yoke of oxen walking knee-deep in the brick material, going around in a circle, some 30 feet in diameter. The first advance from this, was the pug mill, which at first was a very rude affair—a section of a hollow sycamore tree, about five feet long, set on end and an upright shaft placed in the centre, with blades extending from it to near the inner surface of the hollow cylinder. This was operated by a horse at the end of a sweep, which did the work of the six oxen, and did it better. In many parts of the country, where sand was scarce bricks were moulded by merely wetting the mould. They were called slop brick. In those early days the methods of burning must have been very defective, as about two weeks were generally employed in burning a kiln. In what the defect consisted, we are not able to say; but compared with the bricks of the present day, they were inferior in quality, and the loss from melted arches, and from salmon bricks around the margins of the kiln and at its surface, was much greater than is incurred now.

Between 1836 and 1840 several patents were issued for moulding bricks by machinery operated by steam or horse-power. None of these could be called a success, yet every failure, in developing its defects, was a step forward. In 1839 two millions of bricks, pressed from untempered clay as it came from the bank, was made at North Bend near Cincinnati, and used for arching the tunnel of the White Water canal. That tunnel is now used by the "Big Four" railroad. The bricks are quite sound, though the machine by which they were made was exceedingly rude. In 1847 a patent was granted to Nathan Sawyer for a machine which pulverized and screened dry clay and moulded bricks of it under a powerful pressure. About the same time, Woodworth and Mowen of Boston took a patent for making bricks on the same principle, but by a different machine. From this date, the number of patents for brick machinery multiplied at an unparallelled rate. These cover nearly the whole possible field in the manufacture of bricks of every class, including the preparatory processes, such as crushing clay, tempering the same, sanding the moulds, etc. These may be grouped as follows: (1) Preparatory machinery; (2) tempering clay, and moulding "soft mud brick;" (3) stiff mud or cut brick; (4) semi-dry clay brick, or those made from clay as it comes from the bank; (5) dry clay brick; (7) arrangements and apparatus for drying bricks preparatory to burning; (8) brick kilns, modes of firing, preparation of fuel, etc.

In the last twenty-five years, numerous patents have been issued for improvements in each of these classes. The number, we are unable to give accurately, much less to describe the improvements proposed to be secured by each of these. To do this would require a volume, and demand more knowledge than we possess, and more time than we can spare. Suffice it to say, that within that period, no mechanical art has advanced more rapidly than the art of brickmaking, and the arts auxiliary thereto. The only remarkable discovery that has aided in this advancement, relates to the introduction of new forms of fuel for burning bricks. In the use of wood or coal, great difficulty was experienced in maintaining a uniform heat and diffusing it through the kiln. In all forms of solid fuel, the tendency is to concentrate the heat at the place of combustion. This required great care to prevent melting the arches, and demanded a longer period of firing in order that the parts of the kiln remote from the arches might be sufficiently burned. The introduction of natural gas, and crude petroleum in the form of spray, reversed this tendency, as gaseous fuel constantly tends to diffuse its heat as it burns by flame altogether. This relieves the constant attention of the burner in order to maintain a uniform heat as well as of the care to prevent the melting of arches, and materially shortens the time necessary for complete burning.

But the great improvement in brickmaking relates chiefly to the relieving of the art of hand-work by the substitution of machinery and vastly increasing the production in a given time, but the quality of brick produced has not been correspondingly improved. It is a significant fact that in those numerous improvements, no one machine has attained such perfection as to drive its competitors from the field. Perfection still lies beyond.

Written for the Clay-Worker.

HINTS ON BRICKMAKING.

No. 39.

BY "R. BRICK."

[THE BRICK YARD SUPERINTENDENT.

Little has been written of the trials, tribulations and vexations of this onerous position. He is held responsible for all the blunders, accidents, and unfavorable weather. The employes come to him to have their wrongs righted. The proprietors, with their faces elongated, talk of the great fuel bills, the large pay roll, and that everlasting repair bill—"When are we to get through with that?"—"You ought to make more brick and better brick"—"Our competition makes more brick with less men and handles them better, (nine times out of ten there is not a grain of truth in this statement), and can't see why we don't do as well here"—and if they should run short of something to talk about or criticise they take a trip East, North or West, and see the improvements and talk with other manufacturers, and return filled up with new theories, and now know a great deal more about the practical part of the business than the superintendent, then for the next month the superintendent will be initiated into the new ways of making and burning brick, and by the end of that time he will conclude that either he knows nothing about brickmaking or else the proprietor does not.

The trouble arises from the fact that the proprietor is not a practical brickmaker, and when he visits other brick works he gets an imperfect idea of the thing he endeavors to do on his return. The sensible thing for him to do when he goes to see the improvements is to carry his superintendent with him and together they will learn much that will be mutually valuable to them. "A little education is dangerous," applies to brickmaking very forcibly.

The good superintendent is supposed to be on the works before six o'clock in the morning and be the last man to leave, about seven o'clock in the evening, visit the works before bed-time, and get up at least once in the night to see that the fireman and night boss are not "sleeping sweetly there. If he does this and fixes up his books at noon and after supper, he is doing only what he ought to do for he gets paid for all his time. On Sunday he goes to the works just often enough to keep up his temperature to the perspiring point, and gets soot on his boiled linen, an dust on his best "Jim swinger" coat, until his good wife declares that he had better go to, and stay at the brick yard and save shoe leather.

He is expected to be strict with employes and discharge all who do not toe the mark, and always have enough men to keep things moving.

A good superintendent is expected to control and command the respect of those under his charge, and do this without discharging too many, for should he use this prerogative unwisely he would soon be without help, and the works idle.

The best superintendent is the one that can control his men without making many changes among his men, for although most of the work is performed by laborers, yet an old hand who knows just what is to be done and how to do it, is more valuable than a new hand.

The superintendent should at all times be cool and alert, should never get excited, in case of an accident or in time of danger. Again he should always look after the safety of his men, repair or rebuild a dangerous wall or roof before it falls, also study the interests of the firm by whom he is employed. He may feel sometimes that his services are not properly appreciated, still this should not keep him from doing his duty. Your employer may appreciate you without letting you know it, "but a little taffy now and then is relished by the greatest men.

It seems to me that all great and good and wise brick manufacturers, who have efficient and faithful superintendents, should, after the toils and cares of the long hot season of brickmaking, go to the next meeting of the National Brick Manufacturers' Association to be held, the Lord and executive committee only knows where as yet, and take his superintendent with him and combine business with pleasure; take as it were a profitable vacation together, and exchange ideas and notes with hundreds of your craft, who will be there. Don't come like a sponge, only to absorb; don't keep your light under your hat, but get out your little light whether it be one candle power or two, and hold it above your head that it may be seen by others, and I assure you that you will have a better time than you have enjoyed since you had the measles. Your superintendent will learn much that will be of value to you as well as himself, and with higher regard for this our useful craft, and with a determination to do better work the coming season than ever. Again he may enable you to return to your home with your own hat.

Come, my friends, let us reason together. Give the superintendent a chance, and we will have better bricks and more money.

A REMARKABLE BUILDING.

It is possible to swing a cat, says the *New York Tribune*, if any one ever did want to apply that time-honored but rather useless system of measurement, in the four-story brick house at the northwest corner of Lexington Avenue and Eighty-second Street. But to do it without damage to the cat and the furniture, puss must be swung from north to south, not from east to west, for though the house stands upon a lot 102 feet deep, the land is only five feet wide, the actual width of the building being four feet. The sills and lintels are of white marble, and three bay windows run up from the first floor to the roof. It is probably the narrowest brick dwelling house in the city, if not in the country. Small, round windows, like port-holes, let light into the basement, and the doors are mere slits in the brick walls. It was built in 1882 by its owner, Mr. Richardson, who lives in it. He is a brother of Captain "Ben" Richardson, the eccentric millionaire who died in Harlem the other day, and is a wealthy builder and contractor. He owned the lot, and being unable to sell it at a good price on account of its narrowness, he determined that it should not be sacrificed. So he built a house on it for himself, and though the rooms on the inside are barely more than three feet wide, the family say they do not feel uncomfortable in their cramped quarters.

EXPERIMENTS WITH LIME AND BRICKDUST MORTAR.

A correspondent of the *Engineering News*, Mr. C. H. M. Blake, a civil engineer who is located at Guadalajara, Mexico, writes to that journal the following account of experiments with lime and brickdust mortar:

I was recently called on by two mill owners using the same source of supply for water power to make an equitable division of water, one being entitled to one-third and the other to two-thirds the flow of the stream.

The work necessitated the construction of a measuring weir, with lengths of crest proportional to the division required. It was, of course, important to build the weir as rapidly as possible to reduce the suspension of work in the mills to the lowest limit of time.

Mexican lime while remarkably fine, does not possess hydraulic qualities. So called hydraulic lime is made in a town called Yula, but experiments proved it worthless, and hydraulic cement not being on hand, the combination of ordinary lime and brickdust was resorted to. Having had no previous experience in the use of brickdust and lime mortar, and having no time for experiments, the work was constructed with the proportion of two parts lime, one part brickdust and five parts sand. In ordinary work, mortar in the proportion of one part lime to four parts sand is usually employed in Mexico with good results.

While the heart of the masonry stood well and finally became as hard as if laid with hydraulic cement, the parts exposed to wash failed, not having time to become sufficiently set to resist the action of the water. From subsequent experiments I attribute this partly to the lime not being perfectly slaked before use.

As it was impossible to delay the construction for a time sufficient to make experiments, Rosendale cement was procured at a heavy expense ($15 Mexican silver per cask) and employed in the exposed portions of the work.

I have since made exhaustive experiments with brickdust and lime mortar and as other engineers may be called on to construct work under similar circumstances, I venture to submit the result of the investigations.

Equal parts of *unslaked* lime and brickdust were first employed, but the mortar, under water, had no set whatever if used at once. This coincides with the experiments made with unslaked lime and Rosendale Cement in concrete by Gen. John Newton, Gen. Q. A. Gillmore and Wm. E. Worthen, C. E., the results being embodied in their "Report to the Commissioners of Docks on the Bulkhead Walls at Canal and King Sts., New York." (Report 1876, p. 22.)

From numerous experiments the best results were obtained by first slaking the lime for at least four days, then carefully mixing with an equal portion of finely ground brick dust and allowing an initial set before immersion. I allowed two days for this set.

The following formula shows breaking strength of briquettes:

After seven days' immersion, tensile strength 23 lbs. per square inch. After fourteen days, 42 lbs. per square inch, and after twenty-one days, 56 lbs. per square inch.

The samples were broken in a Fairbanks cement testing machine.

The results indicate that where hydraulic cement cannot readily be obtained, the substitution of lime and brickdust is justifiable. Great care should be taken to mix the constituents and thoroughly slake the lime before use. While the set is slow, the mortar is decidedly hydraulic.

The world has fools enough alway,
We know this to our sorrow,
But some not classed as fools today
Will fools be on the morrow.

THE KILN QUESTION.

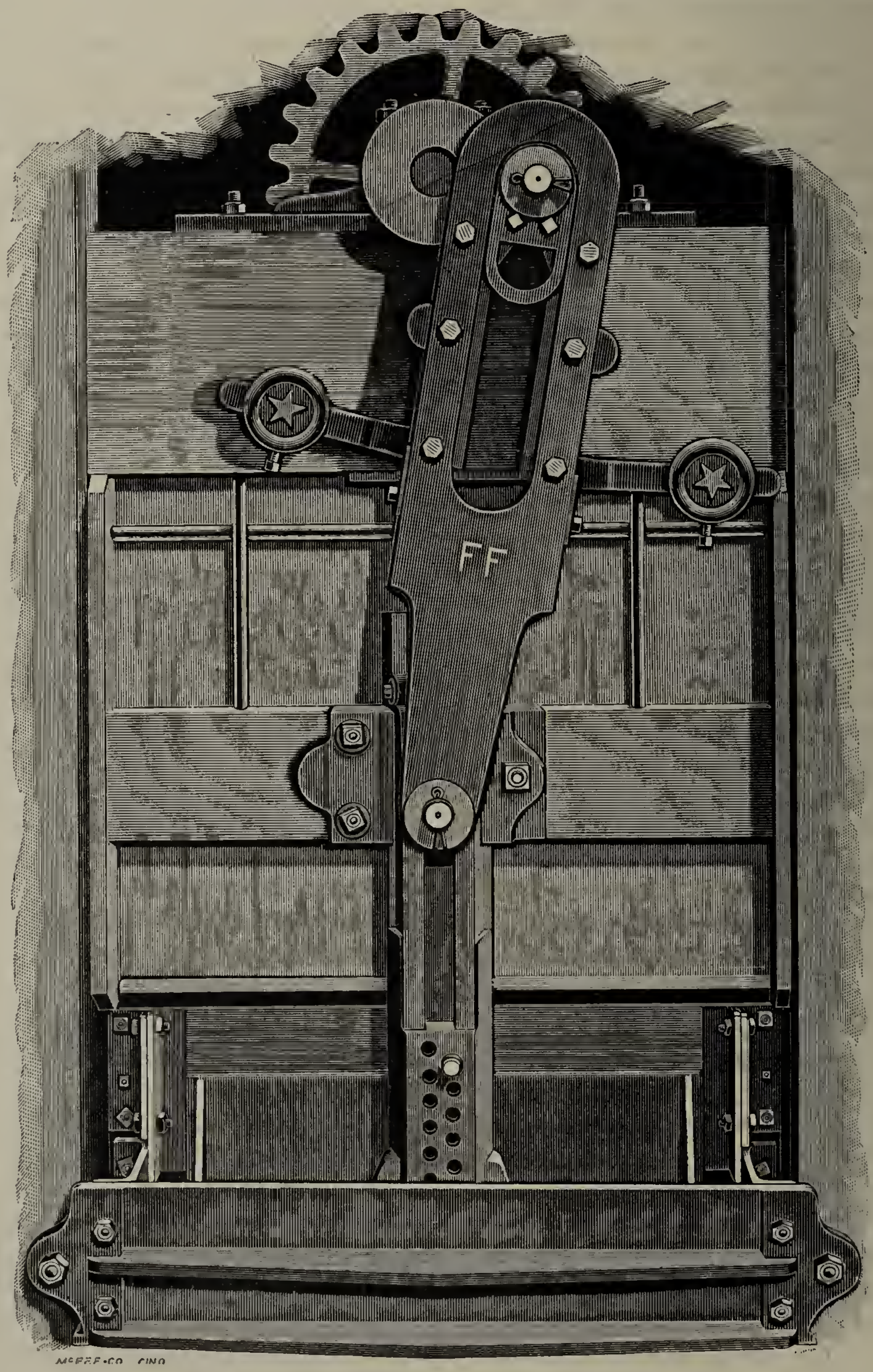
We are frequently asked: Which is the best kiln?" We answer frankly that we do not know, and some of our readers conclude, doubtless, that we are dumb, indeed; not to know; or that our interest and selfishness is such that we are not willing to give our opinion, but the truth is that we *do not know*. And there are reasons why we "do not know." We do not know your clay and you may not know it well yourself. Though you may have been working it for years. There may be secrets in its composition, in its characteristics, that you have not found out and may never find out. We do not know your method of treating your clay from the bank to the kiln, yet very much depends upon the mixing, tempering, drying and setting of tile as to how it will burn or may be burned or "baked." We do not know as to your skill as a burner. Some men are fitted by Nature to shovel coal into the crater's mouth and "Let her go, Gallagher" for the balance. It is not in them to make the nice adjustment of heat from the color. Some men are "color blind" and cannot regulate the heat in this way. There are others that have their notions and there is not room enough in their heads to accept any amendments or additions to the stock they have in store. They would probably pronounce the best kiln for their clay, that was ever built, a consummate failure.

The time is at hand when the cost of fuel and the amount consumed cannot be ignored for the reason that competition will not allow it. The expense must be reduced or the mill must be shut down. In estimating the cost of burning, it is not the cost of fuel alone, but the labor of burning, the character of the ware, the per cent. of good ware, all enter into the estimate. If our neighbor can and does produce an article for much less than we do, he can sell it for less than we do and no amount of whining on our part will do any good. The thing for us to do is to reduce the cost of production to a point that will enable us to compete, or we must quit the business. If the kiln is in the way of having a margin of profit in your business where the prices are dependent upon the cost of production, then you ought to look around for the "best kiln" for your business. Study your wants closely; learn all you can by visiting the factories where other kinds of kilns are in use. Visit factories which are not in competition with you, the proprietors will likely talk more freely. When fully satisfied in your own judgment as to the selection, then be careful in the construction of the kiln. Do not guess at space and distances or vary the dimensions that experience has determined as best adapted to its use. Not a few have made mistakes in trying to improve what they did not fully understand themselves.

THE LATEST FAD IN BRICK MACHINERY.

The following cuts illustrate a valuable device invented and patented by Jonathan Creager's Sons, the well-known manufacturers of the Grand Automatic Brick Machine, Cincinnati, O.

It is a novel contrivance the object of which is to prevent the breakage of the machine caused by stones and other obstructions getting in the molds or presser box. It is simple and perfectly automatic in operation, whenever the plunger meets an obstruction the "Relief Pitman" is instantly released and though the machine may continue to run no harm is done as the plunger remains stationary. Cut No. 1 shows the Pitman as it appears when the machine is in operation and the plunger just ready to press the clay into the moulds. It may be set so that the pressure necessary to force the clay into the molds, stiff, is easily obtained and this and no more pressure is given each mould. If from any cause the pressure exceeds the desired amount the Pitman releases itself and becomes an idler (see cut No. 2) when the obstruction can be removed

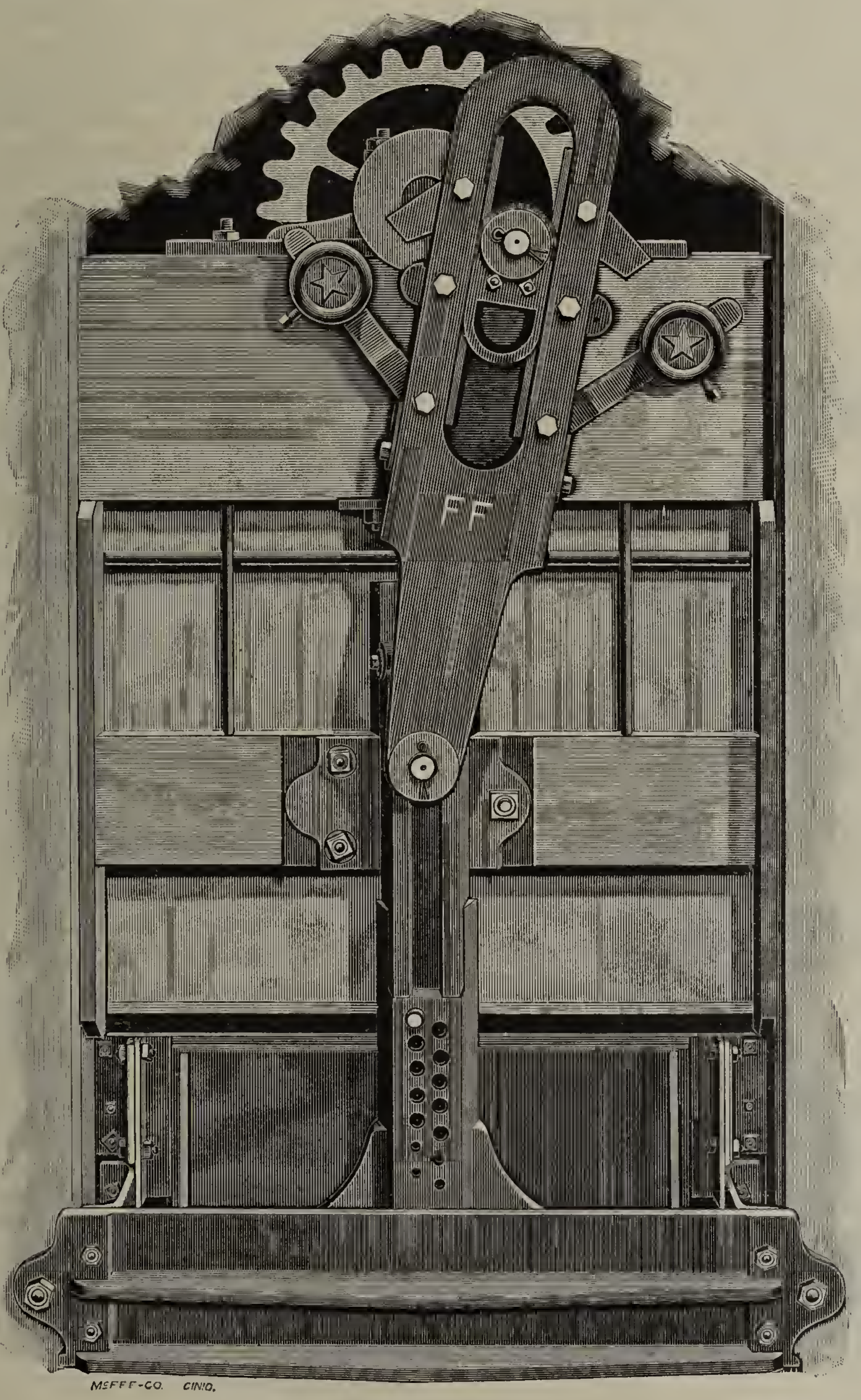


Cut No. 1.

and the Pitman reset in a few seconds, thus affording absolute protection against breakage and annoying delays.

It is a scientific and practical device for pressing each brick uniformly and thus is especially desirable for making brick for repressing.

The Relief Pitman may be placed on both the all-iron and wood frame machines. Many are already in use giving entire satisfaction. It is a valuable improvement to the Grand Automatic which had already achieved a most enviable reputation. The manufacturers claim that for strength, and durability especially it is among the very best of its class and invite the trade to investigate its merits thoroughly.



Cut No. 2.

A PROSPEROUS COMPANY.

The sales of the Marion Steam Shovel Co., of Marion, Ohio, last year included thirty-three steam shovels, seventeen dredges, and twenty-seven ballast unloaders amounting to almost $200,000. Their business through the first half of the present year aggregates almost as much as the entire business for last year. The general management of this immense business devolves upon Mr. H. M. Barnhart, the inventor of the steam shovel and wrecker which they manufacture.

The Steam Shovel is in use in a number of brickyards giving excellent satisfaction. The rapidity with which clay may be dug and loaded makes their use almost imperative to attain the best success in turning out the largest possible product. Another and important advantage in many clay beds is the thorough mixing of the clay from bottom to top in every shovelful taken out. The excellence of workmanship is fully attested in their strength and durability.

In a recent number of the Democratic Mirror (Marion, O.,) a full description of the works, illustrated, is given, together with a full description of the various machines and their many points of excellence. Upon application, the Marion Steam Shovel Co., Marion, Ohio, will forward a full descriptive catalogue of their machinery.

THE EUREKA BRICK MACHINE.

The following item of news is clipped from the *San Antonio Daily Light*, San Antonio, Texas:

"The Mackey Brick and Tile Co., of this place has a cash capital of $75,000 paid up. The Co. owns 2,894 acres of land free from encumbrance, having 106 acres of excellent clay. The Co. has recently constructed a two-story machine-room 36x40 feet; an engine and boiler room 30x40; shed for housing clay 40x100; two drying sheds with a capacity of 25,000 brick; one clamp with iron roof, with a capacity of 264,000 merchantable brick. They have an Atlas engine and boiler of 75 horsepower. This engine furnishes ample power for two Eureka Brick Machines and crushers. The one already in use is warranted to turn out 20,000 pressed brick in a run of 10 hours. The machine and crusher was put up under the superintendency of H. A. Keller, Vice-president of the Eureka Co., St. Louis, Mo. The machine itself is a ponderous affair, weighing 38,000 pounds and exerting the enormous pressure of 40 tons on each brick or 160 tons for the four brick forming a table. The machine had only been working two hours when we first saw it and was working away steadily, smoothly and satisfactorily, giving evidence of the very perfection of motion when the machine has fairly adjusted itself.

"The clay is prepared for the pressing machine by Stedman's Disintegrator, a perfect adaptation of means to end. The pulverization is done by centrifugal force and can be regulated at will by increasing or diminishing the revolutions of the fingers within the box. The dies for pressing the brick are steam heated by an ingenious contrivance and the moisture of the clay forming a partial vacuum in contact with this heated surface, prevents all possiblity of the dies clogging. New as was the machinery and unscoured the surfaces of the tables the work was done smoothly, each hour showing an improvement, the edges of the bricks coming from the machine as perfect as though chiselled out of stone. So hard were these bricks on coming from the dies, without drying, that Mr. Keller using one as a hammer drove a ten-penny nail through a hemlock plank without breaking the brick. The Eureka Machine has been in use eight years has been introduced into every state in the Union and is doing satisfactory work everywhere."

In this connection, it is worthy of remark that the Eureka Co. have confined their advertising exclusively to the Clay-Worker for the past three or four years and the result has been highly satisfactory bringing inquiries and orders from all parts of the United States and Canada, to say nothing of inquiries from other countries.

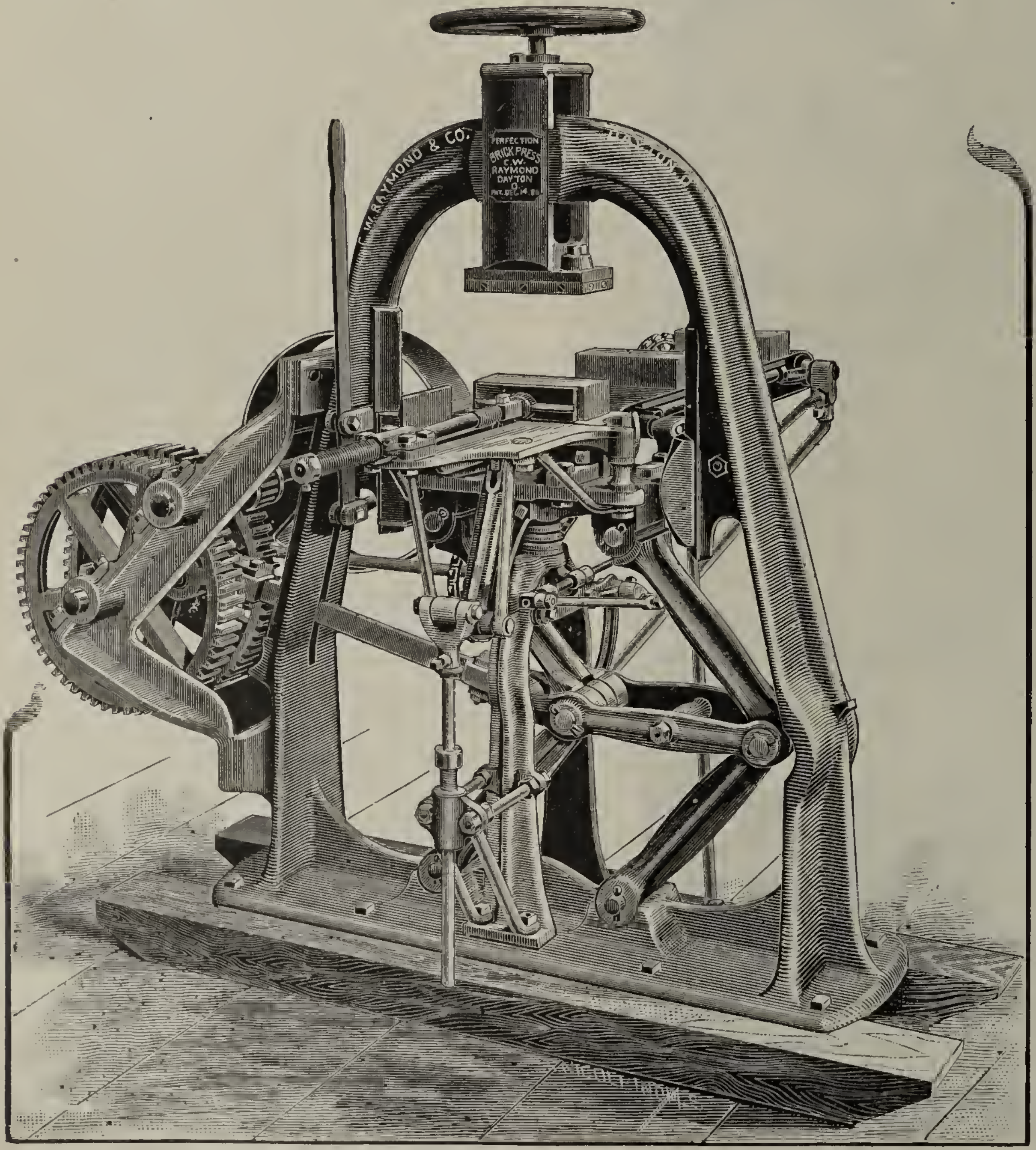
AN AUTOMATIC REPRESS.

Considerable doubt has heretofore existed as to the practicability of repressing brick by machinery so as to preserve their smooth surfaces, perfectly developed edges, and accurate shape. The manufacturers of the press here illustrated claim to have dispelled such doubt and point to the fact that eight of their presses in use for several months are giving as good results as can be obtained by hand pressing.

The capacity of the press is limited only by the dexterity of the operator in feeding it. In the single die press ten to twelve thousand are made per day, requiring one man and boy to operate it, while in their Duplex machine, double this product is obtained.

Less than one-half horse-power is required to run it.

Arrangements are made in the construction of the machine for keeping, as far as possible, all brick of uniform thickness and protecting their finished surfaces during transit through the machine.


C. W. RAYMOND & CO.
PERFECTION BRICK PRESS C.W. RAYMOND DAYTON O. PAT. DEC. 14. '86

Raymond's New Automatic Repress.

The automatic mechanism for feed and delivery is simple and shows very little liability to get out of repair.

The Duplex machine, in addition to making great numbers of brick, is large enough for roofing tile, paving blocks, and various other clay products required to be made in a speedy and economical manner.

Parties who desire a simple, practical machine, which is not excelled in speed or equalled in the quality of its work are requested to write to the manufacturers, Messrs. C. W. Raymond & Co., of Dayton, O., for further information.

"A Perfect Machine."

SUCH 'TIS SAID IS THE NEW AUTOMATIC.

Dayton, Ill., Sept. 3, 1889.

C. W. Raymond &Co., Dayton, O.:

Referring to the Automatic press shipped us June 29th, it gives us great pleasure to testify to its good qualities. It is a perfect machine and does the work of four men, making a great saving in point of labor and always makes uniform bricks.

Very truly yours,
FOX RIVER BRICK CO.,
H. E. Williams, Gen'l Man.

BRICK FOR PAVING STREETS.

At the present time when brick pavements are receiving so much attention, a few remarks on the subject of making the most satisfactory brick for paving purposes from a suitable clay will not be out of place, and would no doubt lead to a profitable discussion.

In general terms pure clay, or kaolin, is a hydrated silicate of alumina; while the ordinary clay is a mixture of such with silica (sand), in a more or less finely divided state, lime, magnesia, soda, potash, iron, and indeed most of the substances which go to make up the surface of the earth. Kaolin and silica are the main ingredients, however, with varying proportions from strong clay to loam. The kaolin gives to the clay the power of becoming plastic when mixed with water, while the silica is a necessary ingredient to prevent a too rapid contraction on drying, which is the cause of cracks. When clay is burnt at a high temperature the kaolin loses its chemically combined water and becomes an exceedingly hard substance, cementing the particles of silica together and forming pottery, terra cotta, or brick, as the case may be. If the silica and the kaolin are in the right proportion, finely comminuted, intimately mixed, and burnt at a high temperature so as to drive off all of the chemically combined water, an infusible substance is obtained which is impervious to water, harder than flint, with an appreciable amount of toughness and elasticity, and which, if white, is called porcelain. The glaze commonly seen on porcelain is both artificial and superficial and is not the porcelain proper.

Now let us see in what way the other substances present detract from the qualities of porcelain, or the perfect paver, at least theoretically. In practice, it would be apt to be found too hard.

The soda and potash are of no harm and possibly some good when in small quantity, but when in large quantity they form with the silica an easy fusible slag, permitting the brick to melt down before the necessary temperature is reached at which the full change takes place in the kaolin. When such clay is used it has to be burnt at a very low temperature, and, as the fusible potassium or sodium silicate acts as a glassy cement, you get a weak, brittle brick. Lime and magnesia, usually associated with carbonic acid which is lost in burning, have a somewhat similar effect, and if in quantity give a brick both weak and liable to crumble when exposed to the weather. The iron, if thoroughly mixed, does little harm, but if in quantity and in lumps it burns to the black oxide and makes weak points in the brick.

And now supposing that we have a strong clay free from any large admixture of injurious substances how shall it be worked so as to produce in the highest degree possible those qualities necessary for pavers?—viz., *smoothness of grain*; *hardness*; toughness; and, what is of first importance in northern latitudes, *imperviousness* or closeness of grain. I may say before going further that there are some clays which seem to have had every preparation already made by nature, and which make a fair paving brick when worked in any way.

The object now is to get the particles thoroughly mixed and as close together as possible, so that the result of the chemical change may find the particles uniformly and firmly. Working with water accomplishes the end of mixing in the most thorough way, and all clays are improved by being well pugged. If it is worked into shape after drying but slightly, as in the case of hand made bricks, you get a very porous brick on account of the large excess of water which goes off on drying, and because the air which has been inclosed in the pugging makes little hollows. The conclusion thus arrived at is that after the clay is pugged it should be worked as stiff, and under as great a pressure as possible, in order to get rid of the two difficulties mentioned above; and would seem to indicate that the brick from a stiff mud machine would be more close and compact throughout its mass, and as a sequence that on burning a more uniform action and a firmer, harder, and more impervious mass would be the result. Such I have unitormly found to be the case. There now comes up the question of toughness, and as that is a property but little considered generally, I would like to call the attention of both brickmakers and machine makers to it, as of utmost importance in pavers, and as a property which can be controlled to a great extent. It depends largely upon the fibre of the brick; for a brick worked in the wet way has essentially and distinctly a fibre, or grain, and it plays a most important part in the toughness of the brick. I think that the great toughness of the auger machine brick is largely due to the combination of a twisted structure on the inside and a longitudinal structure on the outside. However that is, out of a very large number of samples of pavers made from ordinary potters clay which have come to my attention, uniformly the best have been stiff mud bricks, and in many cases they were so infinitely superior to brick made by other methods from the same clay that I feel justified in making the assertion that any strong clay properly worked will furnish satisfactory pavers. It is clearly seen that direction of the fibre can be largely controlled by the machine and the die, and it opens an interesting field for investigation by brick machine makers. As wear cannot be entirely eliminated it must be made as uniform as possible by having the grain of the pavers smooth. It is the granular nature of the dry press bricks which is one of the causes that make them so generally unsuited for paving purposes. I may say that among the stiff mud machines I have generally found the auger machines to make the best pavers, though there is little difference.

There are two words which are used in regard to paving brick which are misnomers and ought to be gotten rid of. The first is "fire-brick." True "fire-brick" is absolutely useless for paving purposes. Advantage is however obtained by having a clay that will stand a temperature sufficiently high to admit of complete chemical change taking place. The second is "vitrified brick." This name should apply to the bricks cemented together by the glassy fusion mentioned above, and are usually useless for paving purposes. The word "pavers" should apply to brick, irrespective of the clay from which they are made, which possess in the requisite degree the necessary qualities of smoothness of grain, hardness, and imperviousness. Whenever some standard in these respects shall have been settled upon all of the qualities can be determined definitely in a laboratory; though actual use is, of course, always the best test, as what is lacking in one particular is often made up in another.

As I have said above most strong clays, if worked in the right way will furnish satisfactory pavers, and it behooves brick men all over the country to examine their clay to that end. The question of brick paving is not one of to-day, or of to-morrow, but of the entire future, and presents the possibility of enormous demands annually increasing. Every brickmaker is interested in the subject directly or indirectly, and should do all he can to assist the introduction of a brick pavement in his vicinity. Remember, however, that for succes good material must be used, and that "brick" is but a generic term and covers a series of products varying among themselves as much as do various stones. C. C.

A CHIEF SOURCE OF CRIME.

Neither Sunday-school nor day-school training, nor even temperance, is fullest safeguard against criminality. The most common fact about convicts seems to be that they were never taught habits of industry. This is the case with nine-tenths of those in the Eastern penitentiary of Pennsylvania while quite a large proportion received a "good schooling," and about one-fifth were abstainers from drink. Of 1,500 at Joliet, in Illinois, 1,087 were fairly educated; 129 were college graduates, 413 classed as intemperate, 784 moderate drinkers, 317 total abstainers. Of 668 admitted last year two-thirds have no trade. Evidently it is time to give the hands more to do in our schools than merely turning over books and using pencils and pens.—*Ex.*

Ethel (shuddering)—"How the trees moan and sigh to-night."

Bobby (speaks whereof he knows)—"Well, I just guess you'd moan and sigh too if you were as full of green apples as they be."—*Exchange.*

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN BY CORRESPONDENT. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Plastic Wire-Cut Brickmaking near Petersborough, England.

Editor Clay-Worker:

In your June, 1889 issue, you published a letter from myself concerning pressed brickmaking. I now send you a similar communication concerning plastic wire-cut brickmaking—called in America "stiff mud bricks."

These plastic wire-cut bricks are made from plastic clay which lies immediately above the "knots" referred to in my June letter. The clay is got during the winter months, watered, and made into bricks during the ordinary brickmaking season, say from commencement of May to end of October. The clay requires nothing whatever mixing with it, but road scrapings from a road repaired with granite improves it very much. No expense has been spared for machinery, in fact we have the best that money will buy. In case of an order for any special sized, or special shaped wire-cut bricks it takes five weeks to manufacture the bricks. The bricks are of good quality and sell freely—they are dried in the open, under shades. We are liable to loss from bad weather.

MACHINERY USED.

One 16 horse-power portable engine in some yards, in other yards the machinery is worked by the same engine that works the semi-dry machines. One horizontal or vertical pug mill, pair of expressing rollers fixed in the front of the pug mill. One side-delivery cutting-off table, cutting off ten bricks at a time and delivering them on a board without handling. In some yards the clay is filled into tip-wagons which wagons are hauled up by the engine, in other yards the clay is wheeled to the pug mill, but there is but little difference in the expense, certainly not more than 4d. per 1,000 bricks.

Since I wrote my June letter I have found out that your correspondent, Mr. A. Crossley, of Ironton, O., sells the side-delivery cutting-off table I referred to, and the only thing that surprises me is, that a cut of it is not advertised in your paper. A brickmaker only wants to see it at work once to get it.

Analysis of the top plastic clay:

Alumina	2.10
Silicious insoluble matter	58.20
Iron	4.80
Lime	11.70
Magnesia	0.30
Alkalies	Traces.
Combined water	7.00
Carbonic acid	9.20
Sulphur	1.25
Carbonaceous matter	3.60
Phosphoric acid	Traces,
Oxygen and loss	1.85
	100.00

The bricks burn cream color, will stand frost, are of very good appearance and used for the best face work.

In my next letter I will endeavor to point out the differences between the two descriptions of bricks, and how from a brickmaker's point of view, one sort is very much better than the other. Several of your readers have written me concerning my June letter and I have replied to them by post, but to future letters, which I shall be pleased to receive, I will answer (with your permission) through the Clay-Worker.

R. S. BLUCK.

Petersborough, England.

COST IN DETAIL OF MAKING PLASTIC WIRE-CUT BRICKS, LONDON SIZE, AFTER BEING BURNT, 9 INCHES LONG, 4⅜ INCHES WIDE, 2¾ INCHES THICK.

Work done during the winter		Brickmaking and burning.			@ per 1,000 bricks.			Cost per 1,000 bricks		
Men.	Boys.	Men.	Boys.		£	s	d	£	s	d
				WORK DONE DURING THE WINTER MONTHS.						
9	2			Removing all earth, gravel, spoil, etc., above the clay and spreading same where desired, clearing the surface of the clay—digging the clay and depositing same for weather to act on @ per 1,000 bricks. [This when thrown into cube yards costs for the top stuff and the clay about five pence per cube yard of material shifted]		2	6			
				Watering and tempering the clay			4		2	10
				WORK DONE DURING THE BRICKMAKING SEASON.						
		1		Watering the clay in heap previous to its being filled into barrows			3			
		4		Filling clay into barrows, wheeling same to, and tipping clay into pug mill		1	0			
		1		Attending pug mill top			3			
			1	Cutting bricks off 10 at a time with a side delivery table			1½			
		4		Wheeling bricks from cutting-off table and setting same in hacks		1	0			
			1	Skintling bricks			2½			
		10	2	These 10 men and 2 boys will make about 20,000 bricks per day		2	10			
		2		Brick burners, with extra labor when on full fires		1	0			
		1		Engine driver with portable engine			4			
				Sundries, such as building up wickets, fixing platting, wheeling coal, etc., done by men overtime, or by an odd man			3		4	5
		13	2							
		5		Wheeling bricks from hacks and setting in kilns		1	0			
		5		Drawing kilns and unloading bricks into carts or stacking on ground			9		1	9
		10								
				Coals for burning bricks in Dutch kilns (all our plastic wire-cut bricks being burnt in this class of kiln.) Mexbro cobbles used costing 12 d. per ton delivered at the kilns		4	0			
				Coal for portable engine—Annesley hard @ 13d. per ton delivered at the engine			7½			
				Oil, waste, stores for engine, etc., etc.,			1			
				Creosote brick oil for brick machinery			½			
				Sundries, such as repairing kiln, fire-holes, protecting bricks from weather, repairing covering, etc., etc.,			3		5	0
				Cost per 1,000 bricks					14	0

The foregoing is prime cost only, and does not include wear and tear, rents, rates and taxes, interest on capital, etc. One shilling equals 24 cents, one penny equals two cents. 40 bricks per 1,000 allowed for waste, i. e., every 1,040 bricks counts as 1,000.

New York News.

Editor Clay-Worker:

The brick market has been a very active one the past month, building being kept up steadily in spite of the fact that the metropolis and its neighborhood has seen as steady a downpour of rain as has ever visited these counties where rainy seasons are commonly looked for at certain periods of the year. In spite of the fact that the supply has been in excess of the demand prices have remained steady. At times there have been large accumulations on the market, but prices were so very near the cost of production that any reduction would have been met by the shutting down of the brick yards on the part of the manufacturers.

The very rainy season that was experienced up to the middle of August has prevented the usual production, and this has allowed the price to be maintained. The present good weather is being taken advantage of by manufacturers to produce to their utmost capacity and all sheds, as a rule, are filled. The manufacturers are asking for extra boats and the supply on the market will again be largely in excess of the demand before September is ended. This will without a doubt break the present firmness and a "slump" will occur. The quality of the brick made this year is equal to the average of former seasons.

I unwittingly overheard a conversation recently over the unreasonableness of certain builders who give special orders for a certain kind of brick and then become angry if their order is not filled within a day or two.

"It's a positive shame," said one of the speakers, "and the only way I can account for it is that most of them really know very little about brickmaking. They will give an order for so many thousand of front brick and want them a special size, a special shade, a special quality. You may tell them positively that it will be a question of five or six weeks before they can be ready, and in doing so you make no allowance for possible mishaps in the kilns or at the yards, for rain, or for the slowness of the boats to carry them down the river. Yet if they're a day late you never hear the end of it. Only lately a builder threatened to get his bricks elsewhere just because the boat on which my bricks were coming down had a slow Captain and they would be a few days behind. It's about time builders began to understand that you don't order bricks as you do dry goods at a retail store—to be sent to your house in an hour."

James Concklin, of Aldrich Bros. & Co., formerly of Haverstraw, died on August 23rd at his residence in Duchess Junction, N. Y. Mr. Conecklin has probably the most famous and best known brick manufacturer on the Hudson River. He was a man of the strictest integrity, and one who put his conscience into his work, so that no other recommendation was necessary for the selling of his brick than the fact that he put his name to it. The business will be continued by the remaining partners of the firm.

All of the brickmakers at Haverstraw are strongly in favor of the World's Fair to be held in this city in 1892, and Gen. I. M. Hedges and Denton Fowler, Sr., expressed themselves recently as enthusiastic on the subject. Ex-Mayor R. A. Vervalen intends exhibiting his brickmaking machinery.

Cornelius Simoson, of Chelsea, Staten Island, recently discovered on his farm what is believed to be a valuable deposit of brick clay. The bed is three feet below the surface and appears to be of large size. If the deposit turns out to be a valuable one, the new industry of brickmaking will be developed on the Island.

BRIC-A-BRAC.

The Village Brickyard.

Editor Clay-Worker:

In the Clay-Worker for September, 1887, was shown the profit per 1,000 brick clear of every direct and collateral expense taken from the actual business of a complete year in which the sales were about one million brick. It was hoped that this exhibit of the working of a four gang hand yard would stimulate some brother brickmaker interested in a machine yard to produce his balance sheet. The profit named was $2.38 per 1,000 brick. Why it is that no response has been made I cannot tell, unless it be that all the brothers are making so much they are fearful to divulge the secret or are making so little they are ashamed to invite comparison.

Sometime since it was decided to remove the Philadelphia House of Refuge or reform school from the city to a farm of five hundred acres some twenty miles distant for the purpose of colonizing the inmates in cottages or families of thirty or forty, with a father and mother to each house.

On the farm are to be placed certain buildings for administration, chapel, reception and workshop, all large and built of brick, with stone basements and trimmings.

The quantity of brick required for these of assorted qualities is about three million, and for the purpose of securing them as low as possible the contractors invited bids from various yards within twenty-five miles of the site; which were as follows:

Mr. W., (Chambers' machine),	$29,076.50
Mr. B. & Son, (Martin machine),	25,768.75
Mr. R., (Hand-made),	27,201.00
Messrs. L. & D., (Martin)	25,825.00
Mr. K., (Martin)	24,391.00
Mr. S., (Hand-made)	24,214.60
Mr. V., do.	24,411.19

All delivered on the ground.

Now if it is true and can be demonstrated that either of these machines can produce brick more cheaply than hand-labor, why is it that five of the bids are so close together and that the fact of how the clay was handled makes no difference in the cost? If Mr. V. in his bid of $24,411.19 has a margin or actual profit of $6,742, why is it his neighbor with a Martin or Chambers' did not under bid him at least a $1,000? And these two machines are of their classes at least fair representatives.

And another point should be noted, the bids were taken from yards not in local competition alone but scattered from five to twenty-five miles apart.

Must we then conclude that the machine yards are not satisfied with $2.38 per thousand profit, or must we conclude their losses on plant are so heavy as to wipe out all this advantage.

Why is it all the little hand yards continue to thrive right under the shadow of the machine yards, and dry kilns? Are we here to stay? Or are we daily being crowded out? Is it possible there is no man with a machine or kiln to sell that has the grit to give us an honest answer to such plain business questions?

The Village Brickmaker wants to make money and does make money, and sees quite as many brothers wrecked by attempting to run clay through iron as in any other way. But then it must be fairly admitted all men are not qualified to run machinery to a profit and the machine to run such a set of men has not yet been completed.

VILLAGE BRICKMAKER.

Why They Fail.

Editor Clay-Worker:

On a recent trip made in the interest of our "Lion" Press, I could not but observe how grossly careless some brick yards were managed. It is so often pointed out that the dry press system has been a failure in a great many yards and usually the press is held responsible but in the yards I visited, the failure was certainly in the fact that no attention was paid to detail, no care bestowed upon the preparing of the clay, in short, no money spent for anything but the press.

Without mentioning the territory I made my observations in and without giving names, dates or kind of press, I will give you a little pen picture of what I saw, hoping it may have beneficial influence where such is needed.

YARD No. 1.—The preparing machinery consisted of a dry pan of ancient date, with a few holes broken into it large enough to let lumps as large as hen's eggs pass. The clay thus *pulverized* (?) was carried above the press and passed over a common sand screen unto a spout where it clogged every now and then and had to be pushed down by a laborer. The clay was fresh from the bank.

YARD No. 2. I saw this yard a day

after a good rain. It was by no means a *dry clay* yard and was not running on account of the previous rain. The machinery was so carelessly placed in an open shed that water and mud was several inches deep all around it and work made impossible. I inquired for the clay they had stored and was shown a large pile of clay which had been properly plowed, harrowed, scraped and piled up *and then left without a roof over it.* The kilns were so poorly protected that the rain had washed up the newly set bricks; in short, everything was of the most primitive character.

YARD NO. 3.—No clay shed! The clay taken from the bank was in such a condition as to clog up the pulverizer every few minutes, thus giving but an inadequate supply of raw material to the press. It would run 10 minutes, stop a while and again run awhile.

These *dry pressed* bricks were so soft when they left the press that I could make an indenture with my finger without very great exertion. The bricks were set into a new kiln built on the side of a hill on a terrace, but so negligently put up that before it was half filled the foundation had sunk considerably and a few days after I had seen it, the rain washed under it demolishing what might have been a source of profit if properly erected.

Is it such a wonder that such yards are not very successful with their dry press plants? Isn't it rather surprising that they get along at all? It certainly is no small compliment to the dry press process that they are able to keep above water under such unfavorable conditions. It was refreshing to me to return to St. Louis and visit some of our yards where the necessity of careful and business like attention to all details is fully recognized. R. S.

Quite Different.

Editor Clay-Worker:

The last edition of the Clay-Worker contains a letter on burning pressed brick by Thomas Parker. For fear that some one might be lead astray by those absurd theories of Parker's, I will state that the brick he (Parker) writes about were burnt by him for this company. And instead of their comparing favorably with nine out of ten kilns burned by any process, I state, without fear of contradiction, that 90 per cent. of said kiln cannot be sold at any price. The arches were totally destroyed while the outer walls of the kiln were all salmon color or not discolored, but almost as green as when placed in the kiln. A few common in centre of kiln were fair, with as many colors as Joseph's coat. These are facts that can be verified by hundreds of reliable men who have seen the handiwork of this noted expert.

ST. CROIX LAND LUMBER CO.,
E. S. AUSTIN, Gen'l Man.

The "Settling" Question.

Editor Clay-Worker:

I am in receipt of Clay-Worker for July, 1889. It presents its usual energetic life, enterprise and intelligence, as a leader in its line of journalism. There are no stale uninteresting articles in the Clay-Worker; while some of the writers show want of practical experience, still, they have something valuable to say. The clay industry is coming to the front, and will, ere long, present one of the largest fields for intelligent study, and for manufacturing industry.

With no desire to make invidious distinctions, I think the article of Prof. R. T. Brown, in your July number, is excellent. He is, however, like all other writers on the subject of burning clay, mistaken in the idea that all clays will shrink, under certain high heat in a kiln. He says: "But when the final equivalent of water is displaced, the heat has reached a point at which the material has become so soft, that when the water has been driven off, the space it occupies is closed and the whole size of the brick is diminished by that amount." And, further, that "this is seen in the settling of a kiln, and indicates the desired change in the chemical composition of the clay."

Prof. Brown stops right where all his predecessors have. Not a single writer on the subject of burning clays has ever got beyond the common hackneyed assertion that a brick kiln cannot be burned well and thoroughly without being settled. I am not sufficiently versed in chemistry to explain just how it is that certain kinds of clay will not fuse or shrink in any heat that can be made in a brick kiln, but that it is so, I assert from an extensive long experience in burning brick, at sundry times and places, as you will see from my first articles. I find that acids do not; to any appreciable extent, act on clays that are composed of pure silica and alumina, and that these clays are infusible, and cannot be shrunk by burning. In fact, most of them will swell under intense heat, especially when the silica is in excess of the alumina. I challenge all the professors and brick burners in the United States, to a practical test of my assertions. I will furnish the clay from different localities, or right here on my own place. If, after a test, I am right in my assertions, I want them to give me the credit of advancing in my line of experience, above all others. If I am wrong, I will modestly take a "back seat" and "hush up."

There is nothing in technology to rebut hard, well-tried experience. I yield the "sceptre" of the "*mud larks*" to no aspirant. I don't say that what I don't know of clay and brick is not worth knowing, for I believe it is the most subtle and difficult of all things to learn, and only claim to know it in part, but I will be a thousand times obliged to any man who can show as long and as varied experience in making and burning brick as I have had, and then candidly say, that I am not right in my assertions.

The great proportion of clay from which brick are made, will shrink in burning, and as it is a rare thing to find a brickmaker who has had experience in any other kind of clay, it is no wonder that the "settling" idea *caps* the knowledge of so-called experts, as writers, and burners. But I think *the "professors"* ought to show that I am wrong in saying that a certain kind of clay will not shrink in burning, or that I am entitled to the distinction of making a discovery. I hope Prof. Brown will honor me with an *open* letter on this subject.

There is an alluvial clay deposit within a quarter of a mile of my brick yard that will shrink in a brick kiln, just as Prof. Brown says. It makes an excellent red brick, and when put on top course of kiln at my yard, will melt and run down like molten iron. Such is the difference in clays. If Prof. Brown, will carefully look over my articles from first to third, in the Clay-Worker, he will see that I point out the natural localities and distinctions of the three great groups of clay: The *diluvial*, the *post* or *ante-diluvial*, and the *alluvial*, or in other words, the *primitive*, the *secondary*, and the *recent*. I find that the acids have very little effect on clay that will not fuse or shrink in burning, hence I conclude, that such clay is nearly pure silica. From this fact, our primitive clays here in the South, are especially good for all kinds of tile and pottery, as it does not warp or shrink in burning.

If the Clay-Worker can have a full and fair discussion on the peculiarities, actions, and proper treatment and uses of clay, it will prove a general public benefit, Our clays here, containing a small amount of *sulphur*, *iron* and *magnesia*, are a sure cure for scrofula, or any kind of sores, when applied in a plastic state; hence, our springs, all coming from clay beds, are noted for health-giving effect. J. W. Crary, Sr.

Among the Queer.

Editor Clay-Worker:

Among the many queer things in locating brick plants was seen by the writer some days since. I will not mention where, or who, but describe briefly.

Two moderatley young men of brilliant ideas in affairs with which they are familiar, contemplated going into the manufacture of street paving brick. They procured a fine bank of as good clay for the purpose as one would expect to see, together with an excellent outfit of machinery, and plans for the most improved kilns.

You will admit that the above is a queer thing for the novice to do. It was out-queered, however, in this instance, by the location selected for the plant. The location selected was on a fill made from bituminous coal screenings, and slack. This fill had been years in accumulating and had reached the average depth of from five to fifteen feet.

Now, imagine a kiln of paving brick raised to a white or settling heat, located on a foundation of coal such as described and you will have no trouble in calculating the settle in feet or cash.

THE NATIONAL MILITARY HOME, LEAVENSWORTH, KANS.

Thinking perhaps your readers might be interested in what is being done at the home, in the way of brickmaking, I send you this brief mention.

The Home paving brick plant is now in full operation. The fourth kiln has just been emptied, and we are glad to report that every brick was found to be a No. 1, strong, vitrified paving brick. For excellent paving brick this clay has no superior. It also gives a fine color and is well adapted to make fine front brick, or terra cotta.

If you desire to examine a model brick plant you can do so at the Home.

The work of constructing and operating is all done by the "old soldiers," who, I am glad to say, take as much pride in the plant as they did in "Sherman's March to the Sea," but, perhaps, with not quite so much alacrity.

To say that the "old soldier" at the Home won't work is a great mistake. One of them was seen laying brick on a kiln with one hand, while in the place of the other hand was a scraper attached to the stump of his arm on wich to clean his trowel.

The managers are more than delighted with their success. Even their first kiln more than met their expectations, being a No. 1 kiln of paving brick. Mr. John, the Home engineer, has shown no little skill as a novice in brick yard construction. The plant is complete in detail and convenient. They have a full outfit of Penfield machinery and have thus far erected four Eudaly down-draft kilns.

For the present the entire output of the plant will be used at the Home, as several miles of streets and sidewalks are to be put in the coming season. The intention is, however, to sell brick to the general public later on.

Many persons are of the opinion that the inmates are compelled to do the work of the Home such as grading, paving, etc., etc., as well as running the brick plant. This is not the case. No "old soldier" is required to do any such labor. If he works it is voluntary on his part, besides his name is entered on the payroll and he is paid for his time in money. Again, the brick used by the Home is charged to the construction account and credited to the Home fund.

So you see the brick plant is only another of Gov. Smith's good business ideas by which he is enabled to give the inmates employment if they choose, and at the same time beautify and adorn the streets and sidewalks of the Home at a very moderate expense.

Every brickmaker who can will do well to pay the Home a visit. You will find the officers cordial and willing to sacrifice their time to show you all the interesting sight, which are many.

"A Patriot."

Why Is It?

Editor Clay-Worker:

I would be greatly obliged if you or any of your readers can answer the following question: Why is it that dry pressed brick made on the **** machine will not burn as well in down draft kilns as semi-dry pressed brick made on the ***** machine? On the up-draft kilns there is no such difference, or if anything, it is in favor of the dry pressed. In burning dry pressed in down-draft kilns here with experenced burners we can not get a settle on them and they come out too soft although there is a good settling heat several days before closing. E. E. L.

Near Chester, Ill.

OFFICIAL ANNOUNCEMENT.

Fourth Annual Convention of the National Brick Manufacturers' Association to be held in Philadelphia, Pa., Tuesday, Wednesday and Thursday, December 10, 11th and 12th, 1889.

As announced in the official report of the proceedings of our last annual convention, the next yearly meeting will be held in Philadelphia, Pa., Tuesday, Wednesday and Thursday, December 10th, 11th and 12th, 1889.

This time and place was chosen by the Executive Committee after carefully canvassing the matter several months ago, and meets with much favor from members of the craft generally throughout the country.

In as much as this is our first convention in an eastern city there will undoubtedly be a marked increase in attendance from the Eastern and New England States, while the Western and Southern craftsmen having already felt the benefits gained from our yearly meetings will take advantage of the opportunity to visit and become better acquainted with the Eastern brethren and by personal inspection acquaint themselves more fully as to the methods of manufacture now in vogue there.

The brickmakers of Philadelphia and vicinity are now all members of our Association and heartily interested and identified with us in the work, thus assuring a most cordial welcome to every one who can meet with us.

It is with no little pleasure therefore that we announce that arrangements have been made for reduced railroad rates over all the leading lines in the Eastern, Central, Southern and Western States. A complete list of these lines will be given in the next issue of this journal together with the Programme which is now being prepared.

Anyone desiring further information as to the objects of our association with a view of becoming members will please address the Corresponding Secretary, Mr. Theo. A. Randall, Indianapolis, Ind., from whom also may be obtained copies of the proceedings of the last convention.

Respectfully,
THE EXECUTIVE COMMITTEE,
by R. A. Speed, *Pres.*
T. A. Randall, *Cor. Sec'y.*

THE CLAY-WORKER

INDIANAPOLIS, IND., Sep., 1889.

Entered at the Post-Office at Indianapolis, Indiana, as second-class matter.

Terms of Subscription:

One copy, one year (in advance) . .	$1.00
One copy, one year (if not paid in advance)	1.50
Six copies "	5.00
Ten copies "	8.00

☞Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES furnished on application.

Correspondence on all subjects of interest to Clay Workers is solicited. Communications from practical men will always be welcome. Address all communications to

T. A. RANDALL & CO.,
14 & 16 S. Tenn. St., Indianapolis, Ind.

THE ART OF ADVERTISING.

It has passed into an accepted maxim that "printer's ink, in the commercial world is the ready means of acquiring a fortune." Taken without important modifications, this is not true, and may as often lead to failure as to success. Advertising is an Art, and like every other true Art has an underlying philosophy beneath it. The man who would advertise successfully must first know—WHAT TO ADVERTISE. If a man has anything to sell by the sale of which the public will be benefitted, as well as himself, it is not only his privilege but his duty to advertise it. Everything that a man has for sale, trade or barter, is a legitimate subject for advertising. If a man transcends this line and attempts to advertise what HE IS, or what HE DOES, he must move cautiously and guard his language well or he will be written down as an egotist by all sensible men and his advertising will injure rather than benefit him.

HOW SHALL WE ADVERTISE? This may relate to the manner of advertising or to the medium through which we propose to inform the public. As to the manner of advertising, the description of the subject of advertisement should be general, avoiding minute details. The language should be simple, clear and easily understood and above all qualities, IT MUST BE TRUTHFUL. Exaggeration, so frequently indulged in by advertisers has shaken the public confidence in advertisements to such an extent that much of the benefit of advertising is lost.

It is bad taste to present the article advertised in contrast with some other article of the same class already in the market. It has become quite fashionable to accompany the advertisement with a wood cut or picture of some kind. If such an illustration serves to make the object advertised plainer it is not only admissible, but every way proper, provided a neat clean cut can be obtained. In many of the advertisements that we see the picture is a disgrace and will repel rather than invite readers. The periodical press at the present time is the best medium for advertising, if not the only legitimate one. The judicious advertiser will look well to the character of the paper through which he proposes to reach the public. The extent of its circulation is generally the first consideration but it is by no means the most important. The class of people who patronize the paper must always be taken into the account. To make a proper selection at this point is perhaps one of the most difficult things in the art of advertising. Local advertising may be done by bills and posters, but this method cannot be depended on to convey the proper intelligence to the general public. It is indeed akin to the rather rude method of advertising by painting fences and logs by the wayside.

The paper selected for advertising should be one that is read by persons connected with the trade in, or use of, the article advertised. There is a class of advertisers who seldom or never patronize the press. They take pictures or specimens of the articles they wish to commend to the public, or samples of the work done by the machine they wish to sell and personally present these to the customers they hope to secure as patrons of their enterprise. This class of advertisers are not all frauds but they are traveling in a path worn smooth by the feet of fraudulent speculators. Let the public, therefore, scrutinize such advertisers with due circumspection.

THE WORLD'S FAIR---HOLD IT AT CHICAGO.

There is quite a spirited rivalry as to the selection of the site for the World's Fair of 1892. At first, the City of New York seemed to take it for granted that the World's Fair could not be held successfully anywhere else than at that Metropolitan City. But Chicago steps promptly to the front and challenges a comparison of advantages making the following substantial claims:

1st. Chicago is geographically central. There is no place in the Republic which can be so easily reached by the largest portion of her citizens.

2nd. That the hotel accomodations are ample for the accomodation of all.

3d. That there is no city in the Union so popular abroad as Chicago. It is favorably known world-wide; it's rebuilding—rising out of the ashes—into such magnificent proportions is generally known over the European Continent.

4th. That there is no place where the industries of the nation will be so largely exhibited.

Chicago, yes Chicago; with her million inhabitants and characteristic enterprise is the place for the World's Fair. We hold up both hands for Chicago.

A NEW BOOK.

"A Treatise on Masonry Construction," by Ira O. Baker, C. E., Professor of Engineering, University of Illinois. This is a very valuable treatise embracing:

Building Stone—the requisites, classification and description.

Brick—Process of manufacture, requisite of good building brick, methods of testing, etc.

Lime, Cement, Mortar, Concrete, Artificial Stone, Quarrying, Stone Cutting, Stone Masonry, Brick Masonry.

Foundations — Ordinary and under water.

Masonry structures of all kinds.

This book is especially valuable, embracing in many particulars a new field in that it treats of well known subjects that have hitherto commanded but little attention. The matter is almost wholly new. The structures illustrated are actual ones. The volume is divided into parts, chapters, articles, sections, etc., making it an easy book of reference. We are especially pleased to commend this work to our readers, knowing as we do, the author personally as a painstaking, honest man with marked ability for the work so well done. The book is 8vo., of over 500 pages, bond in muslin.

For price, address John Wiley & Sons, Publishers, New York.

"Hints on Brickmaking" in this issue is an interesting and suggestive article that should receive considerate attention from every brickmaker. The intimation that the Lord and the executive committee of the N. B. M. A. are slow to impart desirable information to the members of that association is its only questionable feature. Brother Brick should read the official report of the last convention. He will find the time and place of our next meeting announced in same and much valuable reading also.

We call special attention to the sixth paper on "Brickmaking and Burning," by J. W. Crary, Sr., which is given on a preceding page. Our readers will find it particularly interesting and suggestive we think. Indeed it is due to Mr. Crary to say that his series of articles, so far published in our columns, are valuable contributions to our clay working literature. They have the ring of practical experience and close observation—which goes a long way with thoughtful men. If any of our readers have neglected to read them, possibly for want of time, we suggest that they carefully preserve the numbers, a thing which ought to be done anyway, and read them when they have leisure.

Our readers will see by the "official announcement" on another page that the next annual meeting of the National Brick Manufacturers' Association is to be held in Philadelphia, Dec. 10th, 11th 12th, 1889. The selection was practically made at the Memphis convention and so far as we have heard any expression of opinion it gives general satisfaction. The craftsmen in the city of brotherly love will extend a right royal welcome. They well know how it is done; as we have had a foretaste of what may be expected we speak from a very happy experience. The craftsmen from all parts of the country should arrange to be in attendance an make the gathering an historic one meeting as we shall on historic ground.

FILLING THE WANT.

A subscriber at Fort Madison, Iowa, Mr. J. H. Einspajer, sends us a dollar to pay for the Clay-Worker one year for a neighbor, saying: "He has read a few copies of your journal and is so well pleased with it that he now wonders how he ever got along without it." Mr. Einspajer thus performs a kindly service for, and deserves the thanks of, both his neighbor and ourselves. We are indebted to many of our subscribers for similar favors. Indeed, we count ourselves especially fortunate in obtaining not only the good will but the active support of so many influential craftsmen. It is our earnest desire to merit the co-operation of our readers by continuing to give the craft a live, progressive organ, and in the future as in the past, no effort on our part will be spared to make the Clay-Worker a real *practical* help.

EDITORIAL NOTES and CLIPPINGS.

Newark, Ohio, is paving its streets with brick.

Dr, D. M. Houck, of the Chattahoochee Brick Co, has taken unto himself a wife.

The Steelton (Pa.) Brick Co. has been chartered with capital stock of $10,000.

J. L. McWilliams and Geo. W. Ethridge propose starting a brick yard near Daleville, Tenn.

The Buffalo (N. Y.) Star Brick Co. has doubled its capital stock and will enlarge their plant.

The Phoenix Brick Co., of Cleveland, Ohio, has been incorporated. Capital stock $40,000.

The Fairfield County Brick & Tile Co., Lancaster, Ohio, has been incorporated. Capital $12,000.

W. B. Jopling, a well known brickmaker of Augusta, Ga., died in that city on the 28th ult.

The Union Brick Co.'s works near New Cumberland W. Va., were burned recently. Loss $10,000.

The Memphis Brick & Mfg. Co.'s works were partially burned recently. Loss $5,000. No insurance.

S. D. Gorman is prospecting for suitable clay for sewer pipe with a view of building works near Jackson, Tenn.

The Union Fire Clay & Stone Co., Coleman, Columbia Co., O., has been incorporated. Capital stock $10,000.

In a brick-tossing contest at Chester, Pa., two men tied, each unloading a barrow of eighty bricks in fifty seconds.

The Portsmouth (Ohio) Fire Brick Works will put in additional machinery, etc., to increase their capacity 50.000.

If you are seeking a position or want experienced help, read or advertise in our "For Sale, Wanted, Etc.," columns.

The Puget Sound Fire Clay Co., Seattle, Wash., has been incorporated by Chas. L. Denny and others. Capital stock $100,000.

H. P. Spencer and J. P. Hazelton have organized a company and will build large fire brick works near New Straitsville, Ohio

The works of the Whittaker Pressed Brick Co., at Vance, near Kansas City, Mo., were burned Aug. 26th. The building and machinery were destroyed, causing loss of $10,000. Insurance $4,000.

The buildings of Hammond & Shallcross' pottery at Northeast, Cecil Co., Md., were destroyed by fire recently. Loss $4,000. Insurance $2,000.

The Texas Fire Brick & Tile Co., Athens, Tex., are considering the feasibility of increasing their capital stock to $100,000, and enlarging their works.

Taplin, Rice & Co., Akron, O., have favored us with a copy of their new catalogue of Clay Working Machinery. It is a neat little book. Write for a copy mentioning the Clay-Worker.

D. P. Montague, D. J. C. Chandler and others, are arranging to establish an extensive brick plant in the vicinity of Chattanooga, Tenn., about $20,000 will be invested in machinery, etc.

The Nebraska City (Neb.) Paving Brick Co. are now making eighty to ninety thousand brick a day. They are thinking of putting in a tile machine as they think their clay especially adapted for tiling.

The Windsor Roofing Tile Co. has been organized by T. W. Carmichael, of Wellsburgh, W. Va., and others, with capital stock of $10,000. They intend to build roofing tile works near Short Creek, W. Va.

The Pueblo (Colo.) Brick & Tile Co. are putting in an Iron Clad Brick Dryer, of 50,000 a day capacity. The demand for their brick is beyond their present capacity. They recently booked two orders each for 1,500,000 brick.

The proposed purchase of the Detroit brick yards by an English syndicate has been completed and every yard of any importance in and about Detroit will soon pass under the control of foreign capitalists, at least so says the *Free Press*.

It is reported that the Elgin (Ill.) Brick & Tile Co., will sue Mr. D. H. Heager, of Dundee, Ill., for $20,000, for alleged failure to consolidate his business with that company's as agreed upon. Mr. Haeger has three large brick and tile plants in that section.

L. M. Temple, postmaster at Hammond, Ill., writes us that he thinks there is a good opening there for the establishment of a tile factory. Mr. Temple will be glad to correspond with any reliable party seeking a desirable location for such a plant.

Chas. Kaestner & Co., of Chicago, Ills., are furnishing the complete equipment for a new pressed brick plant now being put up by the New York and Tacoma

Brick Works at Tacoma, Wash. Ter. A three-mould Brewis Patent Press, a Raymond Clay Pulverizer, Elevator and Screens and a pair of clay crushers will be used.

Chas. D. Colson, of Chicago, in renewing his subscription adds: "I have been in the brick business over twenty-two years, in England and America, mostly as foreman, yet, with all my experience, I find the Clay-Worker very helpful as well as interesting and always look forward to its coming with pleasure.

Wm. Sondermann, of Hastings, Minn., having noticed the appearance of gold in a kiln of brick opened in his yard recently, had a sample of the sand analyzed by a St. Paul chemist with the resulting discovery of "pay dirt" to the value of $6 to the ton. The expense of working the bed is comparatively nothing and Mr. Sondermann will seek wealth in the sand.

Our readers will observe by referring to Mr. Alfred Crossley's advertisement on page 190 that he has removed from Ironton, O., to Chattanooga, Tenn., where all communications to him should be addressed. Mr. Crossley has accepted a position with the well-known firm of Montague & Co., of the latter city. We wish him much prosperity and many friends in his new home.

M. L. Elsemore, Sec'y of the Hastings (Neb.) Dry Pressed Brick Co., in remitting their subscription adds: "We now have a daily capacity of 40,000 dry pressed and 200,000 common brick using the Improved Eureka Dry Press for the former and Penfield's No. 4 single worker for the latter. Have demonstrated that dry pressed brick can be made from Nebraska clay. Our color is a deep red."

The Eureka Brick Machine Mfg. Co., of St. Louis, Mo., are out with a neat four-page circular inviting all who are interested in bricks and brickmaking to visit the St. Louis Exposition, which is now open and runs till Oct. 20th, and view the "Eureka" in operation. One of their largest machines will be under belt during the exposition. Any of our readers wishing to test their clay on a dry press machine can do so free of charge by bringing to the exposition about fifty pounds of clay.

C. & A. Potts & Co. report trade exceedingly good for month of August, their shops having been kept running full time. They have delivered to one firm at Portland, Oregon, eight disintegrators and to another at Seattle, Wash. Ter., four disintegrators, four pug mills, one horizontal stock brick machine and sander. A complete outfit—brick machine, etc.—to Lancaster, N. J., and four sanders to one firm at Buffalo, N. Y. The demand for their sanders has been immense, making it very difficult for them to keep up with orders.

Fate & Freese, Plymouth, Ohio, are having a greatly increased trade over that of former years. In addition to their usual good trade on tile machines, they have paid special attention to the growing demand for Stiff Mud Brick Machines, and to meet this demand they have placed on the market their A and B Machines which are stronger and have a much larger capacity than would be required for tile only. Their lubricating brick dies which are of a new and original design, they claim will produce perfect brick out of any variety of clay from which brick can be made. They have a large demand for their Revolving Tables for cutting end-cut brick and drain tile. For side-cut brick they have placed on the market a Board Delivery Table. By the manipulation of one lever 12 brick are cut and delivered on a pallet board ready to place on off-bearing trucks. These tables differ from other similar tables in that they cut no waste ends and are more easily operated. This firm will exhibit their machines at Pittsburgh and St. Louis Expositions and Indianapolis Fair, which will afford an excellent opportunity to see these machines in operation.

NEW INVENTIONS.

The following is a list of patents appertaining to brick, tile, terra cotta, sewer pipe, pottery, etc., and the machinery used in their manufacture issued since our last number: (A copy of any of them can be obtained by sending 25 cents, the official price, to Chas. E. Brock, Patent Attorney, 925 F St., Washington, D. C.)

408,213. Brick Mold—E.B.Carter, Huntsville, Ala.
408,337. Clay Working Machine—W. Cunningham, Frankfort, Ind.
408,860. Burning Clay for Ballast—J. Stubbs, Fairfield, Iowa.
409,348. Brick Machine—W. Cunningham, Frankfort, Ind.
409,593. Brick Machine—Kirk & Horton, Wellington, Ohio.
409,186. Machine for Separating Gravel from Clay (two patents)—S. Friend, Decatur, Ill.
409,948. Brick Drying Pallet—C. Fitch, Elizabeth, N. J.
409,988. Brick Machine — Geyson & Thomas, Rochester, N. Y.

HARVEST EXCURSIONS VIA VANDALIA LINE,

September 10, 24 and October 8, to points in Missouri, Arkansas, Texas, Kansas, Nebraska and other States and Territories west of the Missouri River. ONE FARE for the round trip, tickets good 30 days. Accommodations in reclining chair cars FREE from Indianapolis. The reputation of the Vandalia Line for providing superior accommodations, for safety and punctuality, makes any further recommendation unnecessary. For rates, maps and information apply to Geo. Rech, Ticket Agent, Vandalia Line, Washington and Illinois Sts., or to the Vandalia agent, opposite Union Station, or address

H. R. DERING,
Assistant General Passenger Agent, Vandalia Line, Indianapolis.

HARVEST EXCURSIONS.

The Pennsylvania Lines Will Sell Cheap Tickets.

On September 10th, 24th and October 8th, 1889, the Pennsylvania Lines West of Pittsburgh will sell excursion tickets, at one fare for the round trip, to principal points in the Northwest, West, Southwest and South, good returning thirty days from date of sale. For full information apply to the nearest passenger or ticket agent of the Pennsylvania Lines.

AN ACROSTIC.

In anticipation of an immense crowd at the
Near approaching Fair, Sept. 23-28, the Board is
Doing everything possible to accomodate, by
Increasing the facilities in all Departments,
Averting the "jam" incident to some former years.
No expense has been spared, and the Directors
Announce that for the exhibition many
Specialties have been secured which will be a
Treat to old as well as new patrons
Attending the annual festivities for 1889.
The indications to date are flattering, the
Entries being far in excess of any
Former exhibition under the Board's auspices.
Among the features skilled lady riders will
Indulge the visitors at intervals, while the
Railroad rates will be unprecedentedly low.

OUR 1889 CATALOGUE

Is in Printer's hands. Parties desirous of obtaining same will please forward their address at once to insure prompt mailing. Address,

Link-Belt Machinery Co.,
CHICAGO & MINNEAPOLIS,

—OR—

Link-Belt Engineering Co.,
NICETOWN, PHILADELPHIA, PA., &
49 DEY ST., NEW YORK, N. Y.

[Mention the Clay-Worker].

Mention THE CLAY WORKER
When writing to advertisers
Mention THE CLAY WORKER.

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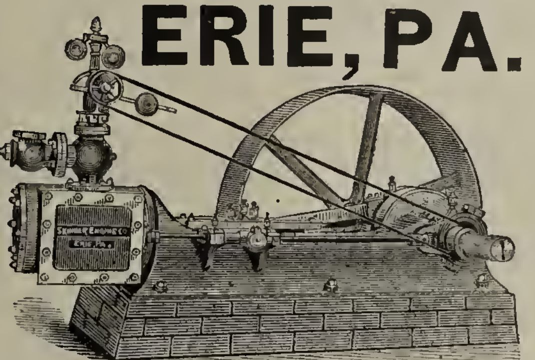

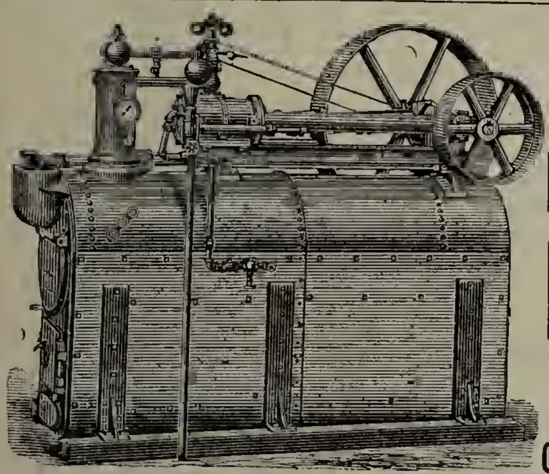

MANUFACTURERS OF

PORTABLE AND STATIONARY

Engines AND Boilers

SEND FOR CATALOGUE.

NEW YORK AND NEW ENGLAND OFFICE:

C. R. VINCENT & CO. 15 Cortlandt St. NEW YORK.

PATTERN
OF
1889
P. L. SWORD & SON.
CLEVELAND, O.
THE
SWORD'S IMPROVED
BRICK MACHINE
SWORD'S IMPROVED BRICK MACHINE P. L. SWORD & SON SOLE MANUFACTURERS CLEVELAND OHIO U.S.A.

To Brick and Tile Burners

CRUDE OIL AS FUEL FOR THE FIRING OF KILNS OF ALL KINDS WITH THE MITCHELL COMPRESSED-AIR OIL BURNER.

Within the past year we have applied our Air Burner to Brick Kilns for the burning of brick with crude oil as a fuel, and the results have been so very satisfactory that we are warranted in now offering our burner as the most successful one for this purpose, as well as for most others.

We are now prepared to fit out kilns of any size, and can assure customers that they will be satisfied with the apparatus. The advantages of our burner over all others are many and result from the use of compressed air for the operation of the burner in place of steam, which is used in all other burners.

The advantages may be stated as follows:

1st. Our fire is always under complete control.

2nd. Our burner remains lighted with a small fire, in a cold, damp arch. No steam burner, that we know of, will produce a sufficiently small and gentle fire for the early stages of brick burning.

3d. We require no specially constructed furnace or kiln. We can apply the burner directly to the arches without furnaces, or to any style of furnace.

4th. The drying off process is much more quickly and cheaply accomplished with our burner because we avoid blowing out steam into the bricks; we use only air.

5th. We make a saving of from two to three days in the time required to burn a kiln.

6th. It only requires one man to each shift to attend to the entire kiln.

7th. Our burner does not crack or melt the arches and yet it burns the kiln hard to the top course.

8th. The fire set at any desired strength in an arch will remain at that strength until altered by the operator.

It is useless to attempt to state the time required to unrb a kiln, or the amount of oil needed, because clay differs greatly in different localities; bricks are set to different heights, and bricks are burned to different degrees of hardness and the amount of fuel required varies accordingly.

To burn the whole kiln into good, hard bricks with average clay will require about one barrel or 40 gallons of crude oil per thousand brick; or 40 gallons of oil about equal 10 bushels of good Pittsburgh coal.

Upon investigation, you will find that this is better than is done by any other burner, and for the advantages as mentioned above, you will find our burner to be in every way superior to all steam burners.

We have fitted up the Cincinnati Brick Co. yards near Addyston, Hamilton Co., Ohio, on the C. I. St. L. & C. Railway, (Postoffice address, Johnston Building, Cincinnati, Ohio) and that Company has burned about two and one-half million brick with our apparatus. Anyone will be welcome at their yard to see the burner in operation, and the foreman, Mr. A. C. Spahr, or the Company will give all the information desired. In the case of this Company, we run not only the kilns, but the boilers and all the machinery on the place. For terms and information, address

**Mitchell Compressed-Air
Oil Burner Company,**
P. O. Box 188,
CINCINNATI, - - OHIO.

FOR SALE, WANTED, ETC.

☞Advertising rates in this column 20 cents a line, or 3 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion.☜

FOR SALE. One set of Clay Rolls.
M. F. WILLIAMS & Co.,
1417 N. 2nd St., St. Louis, Mo.

FOR SALE. Brickyard and bed of fine clay at Kansas City, Mo. Address
Box 57,
8 2 c. Care Clay-Worker.

WANTED Capital to join in manufacture of superior Pressed Brick and Terra-cotta. Demand unlimited. Address
Box 55,
8 2 c. Care Clay-Worker.

FOR SALE. One steampower sewer pipe press with dies from 3 to 24-in. Also cluster dies for tile from 3 to 7-in.
A. O. JONES & Co.,
9 tf. d. Columbus, O.

WANTED. A situation by an experienced and reliable brickmaker and burner. Familiar with old and new methods of burning. Address
7 tf t. "BRIX," Care Clay-Worker.

FOR SALE. Clay land on track; unlimited cash demand for brick in Duluth, St. Paul and Minneapolis. Address
F. McNAMARA,
5 6 c. Little Falls, Minn.

FOR SALE. Bennett Brick and Tile Machine, nearly new. No. 4 Penfield Brick and Tile Machine in good order. Four complete tempering wheels for steam power.
WM. E. HINCHLIFF,
8 tf d. Room 3, 159 La Salle St., Chicago, Ill.

BRICKMAKERS making soft mud brick can learn of a way to burn their brick for half their present cost, if they are where soft coal can be bought cheap. (No mixing coal in brick.) Address.
Box P,
8 tf. t. Care Clay-Worker.

WANTED. A partner in an established fire front and ornamental brick works in the vicinity of New York City. The location and natural advantages are such as to defy competition. Address Box 220,
8 3 d. Woodbridge, N. J.

WANTED. Situation by a first-class terra-cotta and face brick burner and setter, understands all kinds of muffle kilns and can do all repairs.
Address MARK P. GOLDEN,
8 1 c. Medford P. O., Mass.

WANTED. A competent man having thorough knowledge of Fire Clay and ordinary brickmaking, also of constructing brick kilns, to go to Tacoma, Wash. Ter., and superintend brick works there. Apply in writing, stating pay expected and qualifications to
A. GEDDES & Co.,
9 1 d. 403 Royal Insurance Building, Chicago.

FOR SALE OR RENT. Brickyard near Richmond, Va. 21 acres, railroad switch to the kilns, abundance of best clay, new buildings, sheds, clamps, wheels, moulds, barrows, mules, carts, etc. For information, apply to
JOHN C. GIBSON,
Richmond, Va.
4 6 c. or J. J. Gordon, P. O. Box 228, Cincinnati, O.

FOR SALE. One New Departure Brick and Tile Machine with pallets and brick dies. One 50 h.p. engine, and boiler with pumps and line shaft belting; complete outfit. Also one Brewer-Tiffany Tile Mill and two roll crushers; one 15 h.p. engine and boiler with pumps, all in good order. B. F. TOWNSLEY,
9 tf d. Aledo, Ill.

FOR SALE. One-half of an Oven Kiln Brick Yard, 16,000 daily capacity. Brick cost $5.00 and sell from $8.00 to $10.00. Have poor health—MUST SELL. Price $8,000, one-half cash, balance on time, or will take brick. Possession at once. A million brick sold ahead.
JAMES F. ZEDIKER, Box 86,
8 4 c. Grand Island, Nebraska

A RARE CHANCE FOR A PAYING BUSINESS IN KANSAS CITY. A first-class summer and winter brick plant. Present capacity, 60,000 per day with power sufficient for twice the quantity. Fine clay bank of four acres near the city. Average depth 50 feet. Everything in running order. Will lease to some company or individual wanting a good business in the most rapidly growing city in the country. For further information, communicate at once with
E. D. BIGELOW,
9 1 c. 17 West 9th St., Kansas City, Mo.

The Cincinnati Corrugating Co.

Superior Iron and Steel Roofing. Patent edge Corrugations. Ornamental Ceilings. Substantial Arches. Improved Lath.

Greatly Enlarged Facilities, Their own Rolling Mills. No chance for poor material. Everything guaranteed the best.

—NEW ADDRESS—

The Cincinnati Corrugating Co.,
PIQUA, OHIO.

Mention the Clay-Worker.

SOLE MANUFACTURERS.

Main Belting Co.,

Manufacturers of the Celebrated

Leviathan Belting!

WHICH FOR

Strength and Traction Power

HAS NO EQUAL.

Specially adapted for Brick and Tile Machinery.

Unaffected by Heat, Steam or Dampness.

Send for Price List.
Samples sent on application.
Mention this paper.

FACTORY AT PHILADELPHIA.

Address,

Main Belting Co.,
248 Randolph Street, CHICAGO, ILLS.

NOTE—To any responsible party sending us measures, we will ship a "Leviathan" Belt on sixty days trial; to be paid for if satisfactory.

SEE THE BATTLE OF ATLANTA.

Market St. Between Ills. St. and State House, Indianapolis.

—FOR—

Tile and Brick Yards.

For handling Coal, Sand, Clay, Grain, Tan-Bark, Cinders, Ores, Sawdust, Lime, Cement, Shavings, Cotton-Seed, etc.

IOWA PIPE AND TILE CO.,
Des Moines, Iowa, Sept. 24. 1887.

Borden, Selleck & Co., Chicago. GENTLEMEN—We have used the Harrison Conveyor for the past two years. It takes about 90 tons of clay per day from our dry pan and distributes it hrough our cellar. Gives good satisfaction. Yours Truly, IOWA PIPE & TILE CO.

BORDEN, SELLECK & CO., *Mfrs. and Sole Agents,*

Send forillustrated catalogue. **48 & 50 Lake Street, CHICAGO.**

"NEW DISCOVERY" KILN.

PIKE & SCHOPP, INVENTORS.

It Heads the Procession!

The "New Discovery" is a round down draft kiln with no grates, furnace doors, sub-arches or dampers, except at the stack, bound with iron bands, securely fastend to an arched iron door frame. This kiln is the result of years of experience by practical and successful tile and brickmakers, at a cost of thousands of dollars.

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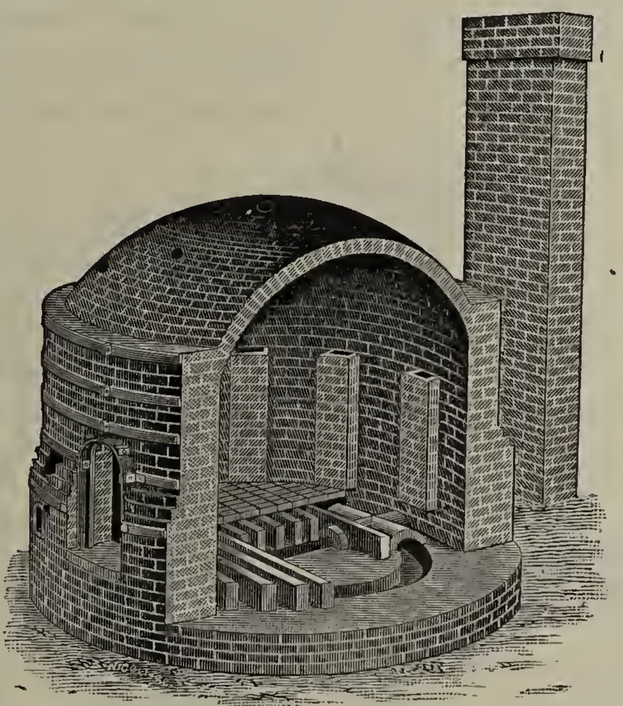

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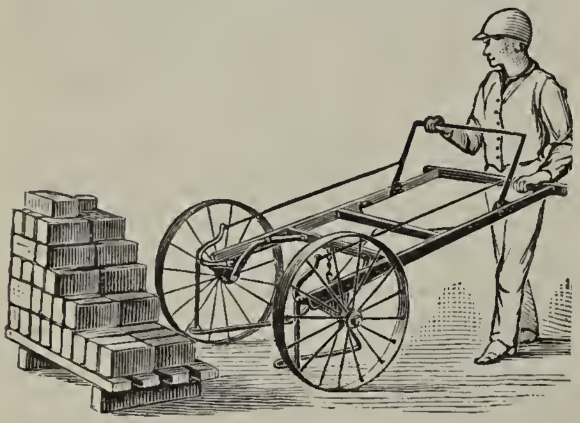

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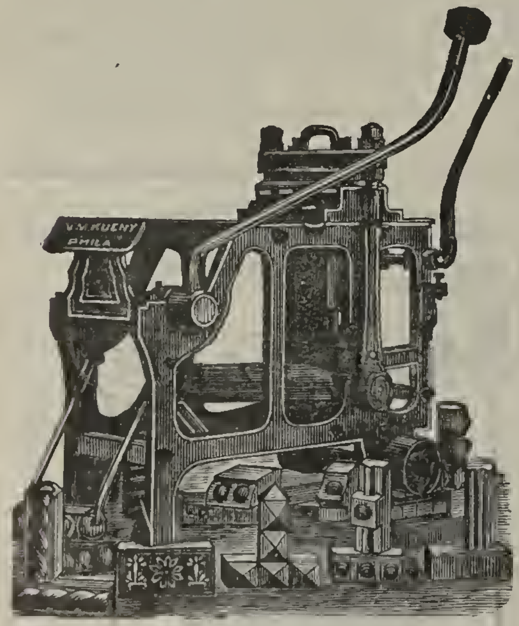

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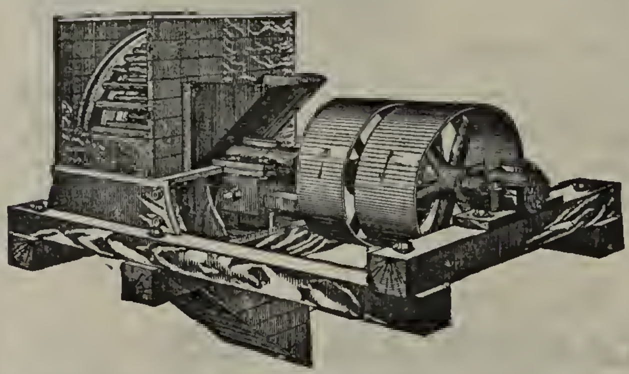

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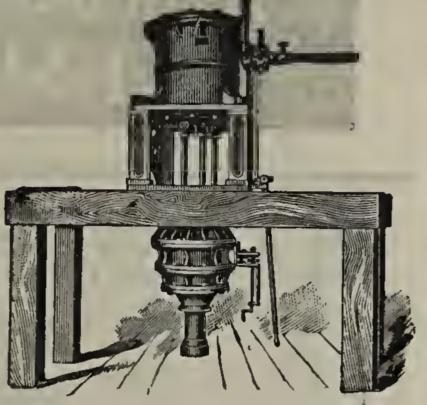

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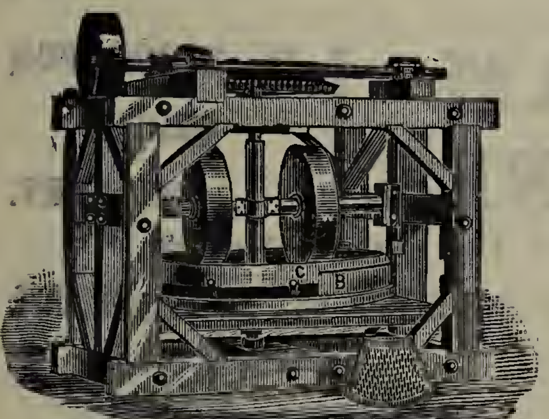

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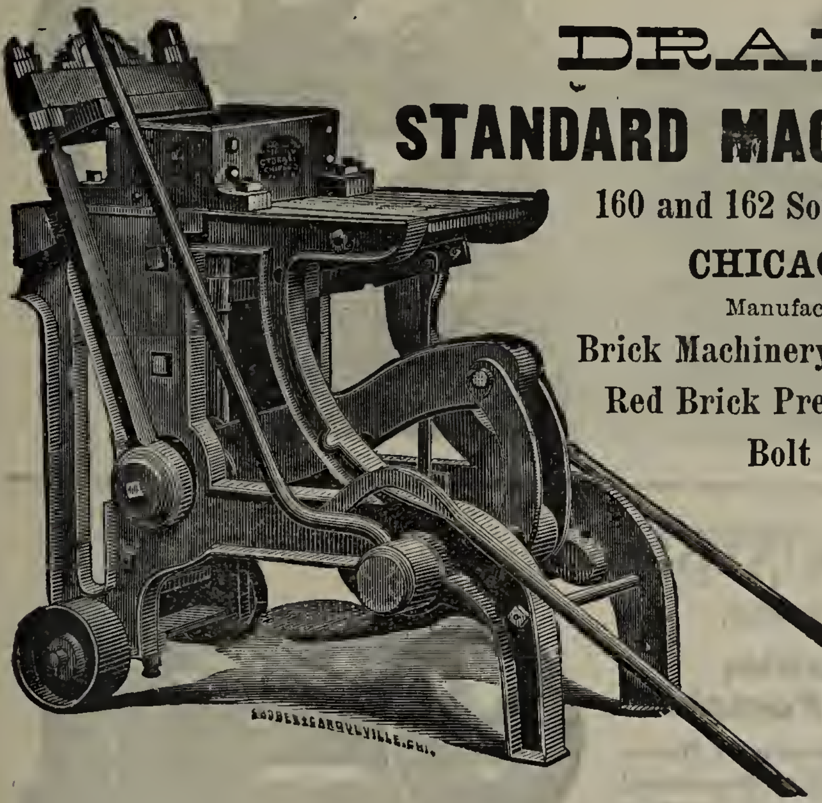

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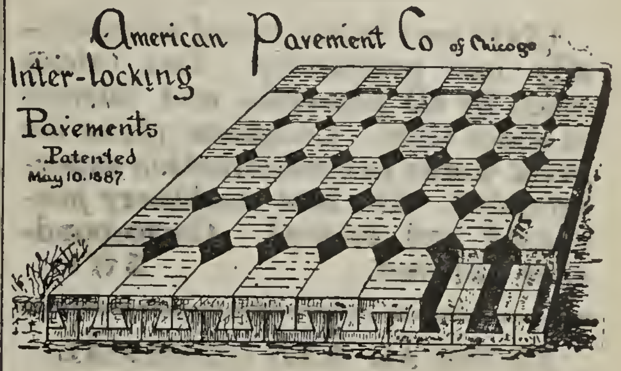

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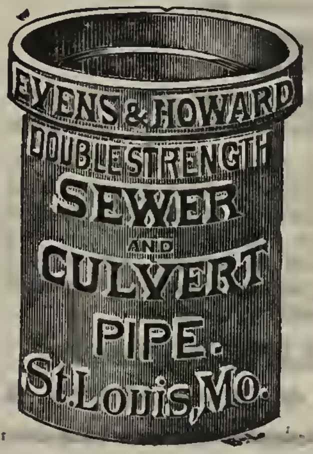

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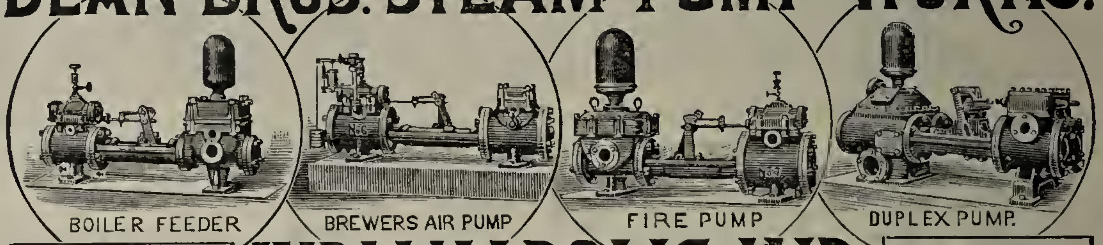

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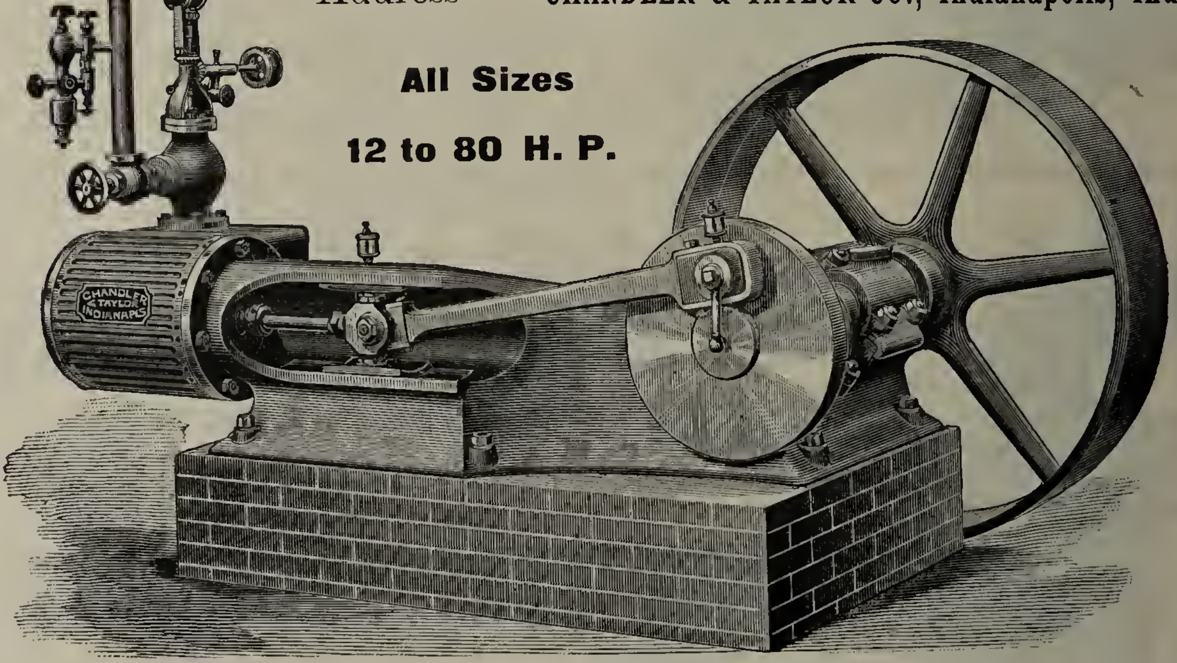

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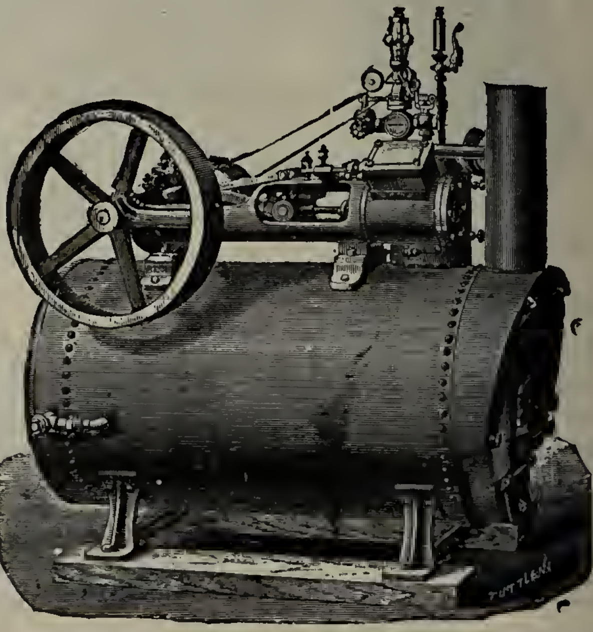

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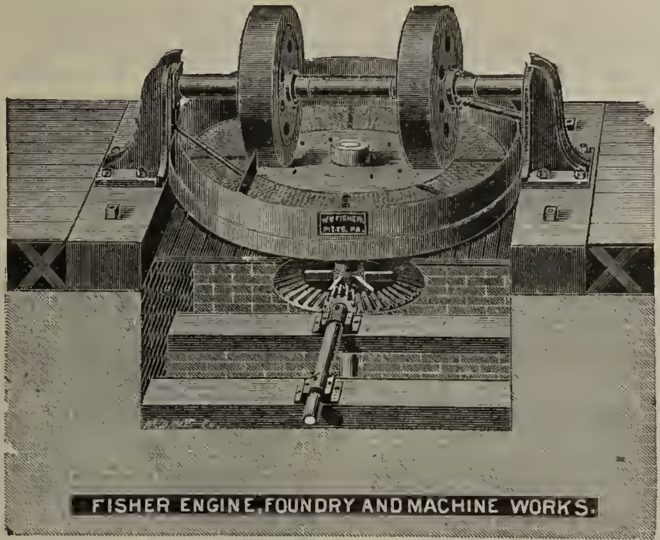
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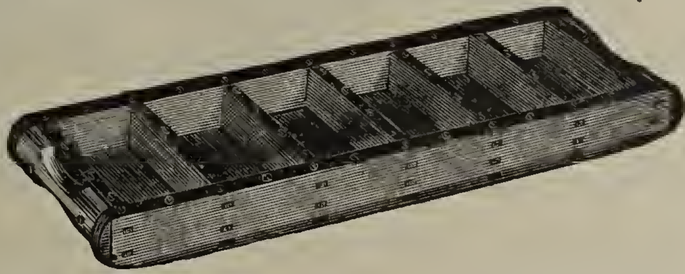

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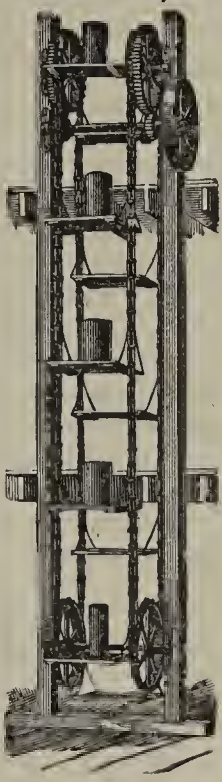

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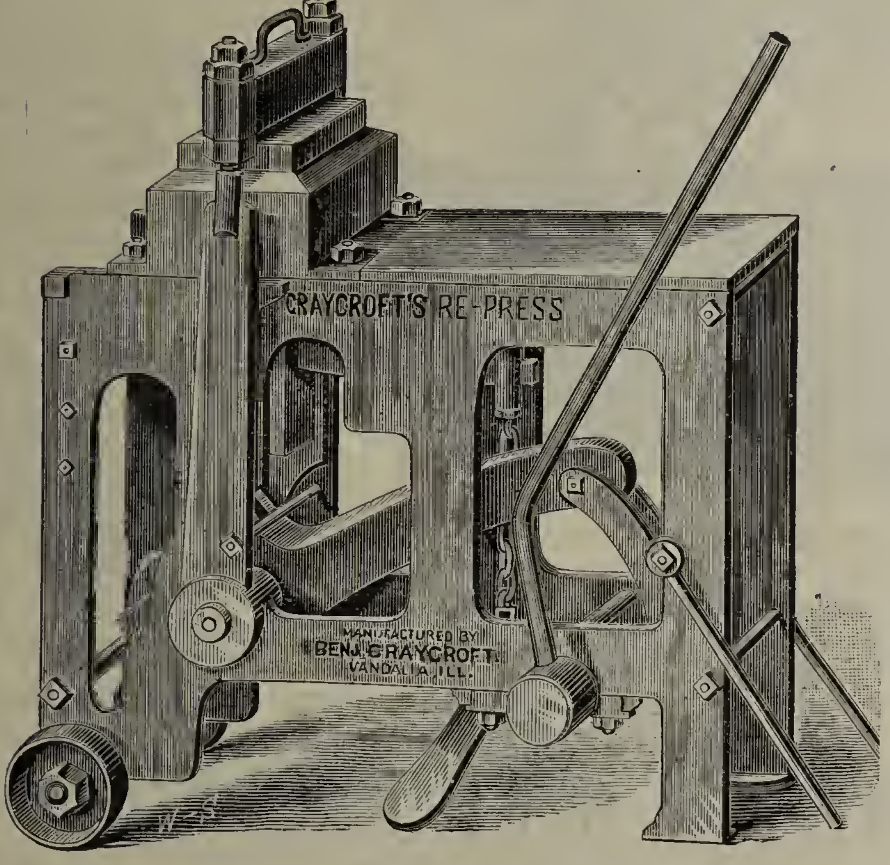

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This press has all modern improvements, and is equal to any in the market.

It is manufactured of steel, wrought and cast iron, and cast iron, and combines strength, power and durability.

It is used for repressing red brick, which are used for the fronts of fine buildings, and enables the manufacturer to make good pressed brick at a slight advance over the cost of ordinary red brick.

The press is also used to repress fire brick.

Sample bricks from this machine furnished on application.

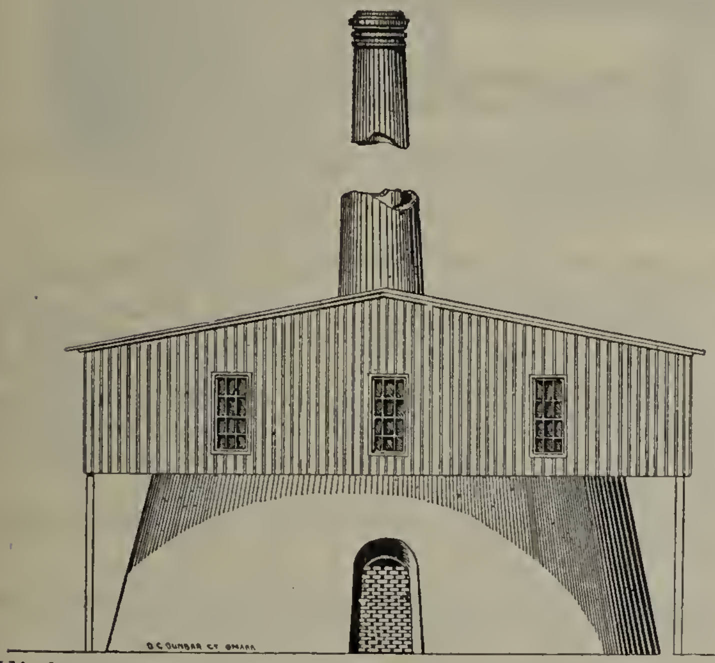
Approximate Weight, 900.

Address, **BENJ. CRAYCROFT, Vandalia, Ill.**

THE CONTINUOUS KILN CO.,

1110 Farnum Street, Omaha, Neb.

C. F. Goodman, Pres. and Treas. F. D. Cooper, Secretary.
Max. A. Th. Boehncke, Superintendent.



We invite the attention of all brickmakers to our improved method of drying and burning brick.

Our **Combined Dryer and Kiln** patented January 8, 1889, should be investigated by all who are seeking more economical methods. By its use the following advantages may be obtained:

Eighty per cent. fuel saved.
A Perfect Result from any Fuel.
No Loss in Burning.
All Uniform in Color and Quality.
Brick Burned in Winter as well as Summer.
Expenses for Repairing Small.

Write for descriptive circular and full particulars. (Mention Clay-Worker.)

JUST PUBLISHED.

Tables of Analyses of Clays, Etc.

Showing the composition of all the principal clays in Europe and America, a book for all interested in clays and their products. Compiled and arranged by Alfred Crossley. Price, One Dollar. Postage Paid.

Extracts from the Author's Preface—Every clay owner should know all about his clay if it is of any value, and one of the first steps to a full and correct knowledge of clay is to have it subjected to a chemical analysis. But it is not enough for a man to know his own clay, he should also acquaint himself with the properties of other clays. and in fact, by his very knowledge of others he will be the better able to judge of the value or otherwise of his own. This little book is intended in an humble way to supply that knowledge. In it will be found the analyses of the best known and most celebrated clays of the Old and New World, with many others of lesser note but in some cases, of equal quality. * * * To each analysis, as far as known, I have appended a remark as to the character of the goods actually made from it. This, I apprehend may be useful as affording a clue to what line of manufactures other clays of like character may be very properly applied. * * * To make the book more useful to the practical man, I have added some blank space at the end, ruled and headed, so that parties can fill in the analysis of their own clay and any others in which they may be interested.

Sent post paid, on receipt of price by the publishers

T. A. Randall & Co.,
Pub's "Clay Worker," Indianapolis.
Or by the author, A. Crossley,
Chattanooga, Tenn.

THE

Pan-Handle SYSTEM.

Its Territory, Facilities and Advantages Offered to the Traveling Public.

This system of railroads embraces the following lines: The Chicago, St. Louis & Pittsburgh railroad; the Jeffersonville, Madison & Indianapolis railroad, and the Indianapolis & Vincennes railroad.

The Chicago, St. Louis & Pittsburgh railroad is the Great Through Line to the East, via Columbus and Pittsburgh.

The Jeffersonville, Madison & Indianapolis railroad is the popular connecting link between the North, Northwest, South and Southeast.

The Indianapolis and Vincennes railroad is the direct and short line between the North, Northeast and the Southwest.

The facilities and advantages of the Pan-Handle System are in very particular in keeping with the progressive spirit of the times and the demands of the traveling public. Its facilities for the transportation of its patrons are sufficiently adequate to guarantee to all comfortable and pleasant accommodations.

The prominent advantages are its Through Coach and Sleeping Car service; Through Ticket and Baggage Check System; Prompt Connections and Speedy and Safe Transit.

Full information regarding Through Tickets, Rates and Movement of Trains can always be obtained from agents of the Pan-Handle Route.

Indianapolis offices: Union Depot and City Ticket Office, 48 West Washington St.

H. R. DERING,
Ass't Gen'l Pass. Ag't, Indianapolis, Ind.
JAS. McCREA,
General Manager, Pittsburgh, Pa.
E. A. FORD,
Gen'l Pass. Agent, Pittsburgh, Pa

The J. D. & W. Ry.

Short Line to Kansas City and the West.

Lv	Indianapolis	8.35 am.	11.00 pm. (daily.)
Ar	Decatur	2.43 pm.	4.00 am.
	Springfield	4.40 pm.	6.00 am.
	Jacksonville	6.10 pm.	7.12 am.
	Hannibal	9.35 pm.	10.40 am.
	Quincy	9.50 pm.	10.45 am.
	Keokuk	11.15 pm.	11.35 am.
	St Louis	6.15 pm.	7.45 am.
	Peoria	5.45 pm.	9.55 am.
	Kansas City	7.10 am.	6.30 pm.

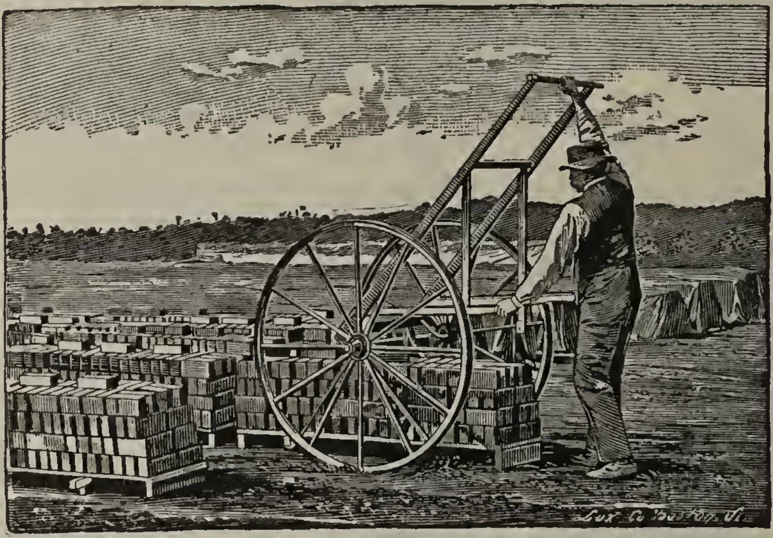
The only line runing reclining chair cars daily between Indianapolis and Keokuk, Ia., without change, running through Decatur, Springfield, Jacksonville, Chapin, Bluffs and Clayton, Ills. To Quincy, Ills,, and Hannibal, Mo., without leaving the train.

City Ticket Office, 134 South Illinois Street, Indianapolis.

H. A. CHERRIER,
Ticket Agent
JNO. S. LAZARUS,
General Fr't and Tkt Agt.

Economy Portable Brick Hake.

Patented Sept. 22, 1885, Re-issued Feb. 23, 1886. By
M. WALKER and E. MINER, Yankton, Dakota.



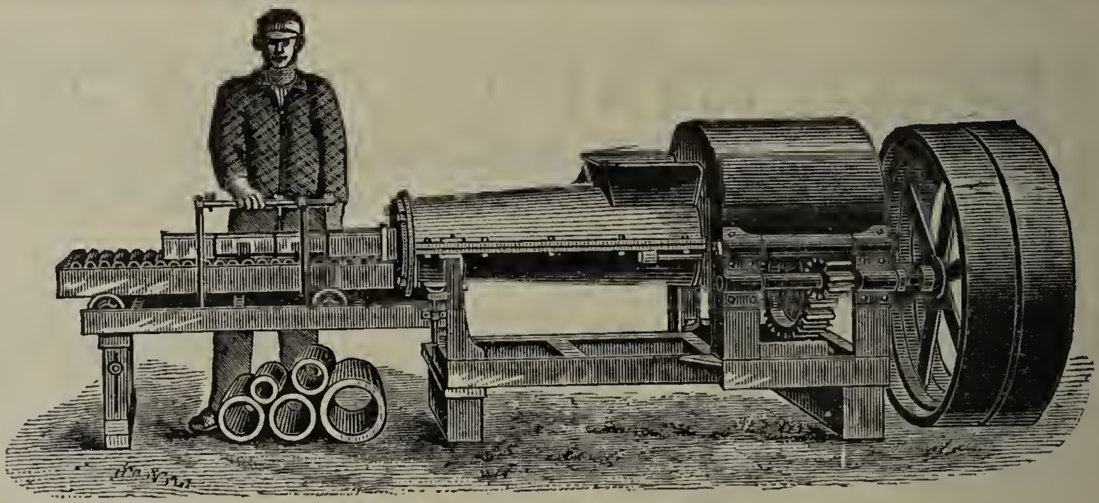
We desire to call the attention of all brickmakers to our PORTABLE BRICK HAKE, which certainly furnishes the cheapest and best means of handling brick from the machine to the yard, and from the yard to the kiln ever yet made use of. By this device the brick when taken from the machine are placed directly upon the haking boards, and when filled the haking boards are taken up by the truck and conveyed to the yard, where they are set down in rows end to end, where they remain until dry, when the truck comes again, picks up the hake of brick and takes it to the kiln. Thus one man does the work of four and the bricks go into the kiln in much better shape by not being handled while they are soft. We have a truck made especially for handling soft molded bricks on pallets. Yard County and State rights for sale. Please address for circulars and for further information,

YANKTON PRESSED BRICK CO.,

Or either of the undersigned, patentees,
M. WALKER, or E. MINER, Yankton Dakota.

KELLS & SON'S IMPROVED Brick and Tile Machines!

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of Brick and different sizes of Tile by changing dies. For strength and durability we except none. We chalenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22, 1880; and February 12, 1884. We can furnish Crushers and also Trucks.

We can produce side cut Brick with our down cut-off, and make perfect edges and corners without the use of water or oil.

We have had Twenty-two Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 18 inches and on our No. 2 Machine we can make tile from 2½ up to 12 inches.

☞For Illustrated Circulars, Prices, etc., address

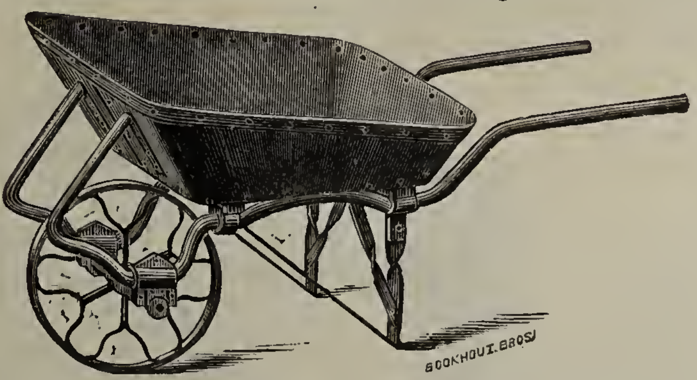
KELLS & SONS,

SHOP NEAR NEW COURT HOUSE. ADRIAN, MICH.

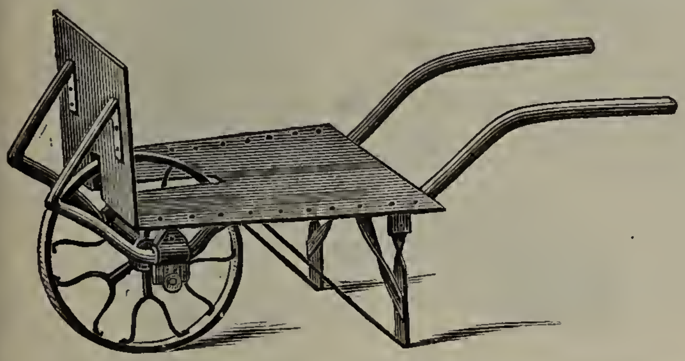
The National Barrow and Truck Co.,
82 and 84 Fulton St., New York City.

Manufacturers of Steel Wheel Barrows for handling Sand, Clay, Brick, Coal, Etc.

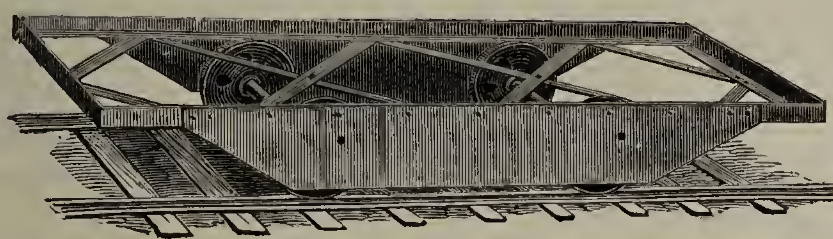
Also manufacturers of the Fitch Steel Pallets, Wrought Iron and Cast Iron Brick Drying Cars a specialty.



Our Barrows are used largely by the brick manufacturers in New Jersey and along the Hudson River. For our Drying Cars we refer to the Lorillard Brick Works, Keyport, N. J., and for our Pallets to Perth Amboy Terra Cotta Works, Perth Amboy, N. J. Send for illustrated catalogue and price-list.



BARROWS FOR GREEN BRICKS.



WROUGHT IRON BRICK CARS.

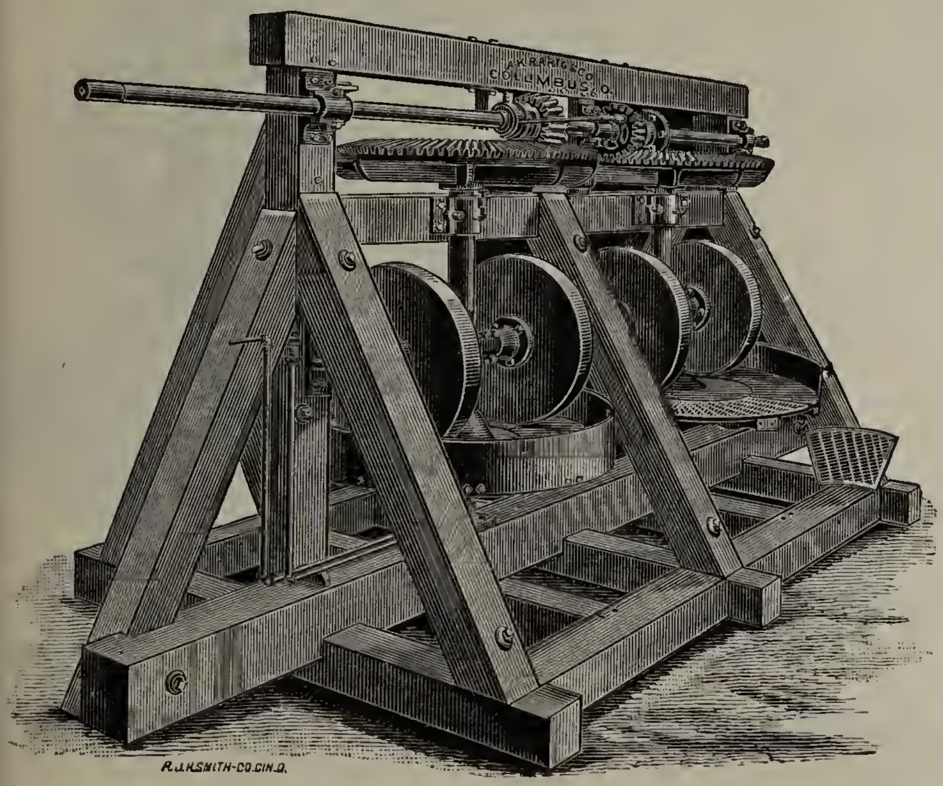
AVERY'S SEAMLESS STEEL BUCKETS FOR CLAY, ORE & ANY DAMP SUBSTANCE.

MANUFACTURED BY THE AVERY ELEVATOR BUCKET Co CLEVELAND. OHIO.

WE MAKE SEAMLESS STEEL BUCKETS FOR EVERY USE

We do STAMPING and PRESSING of sheet metals for all classes of work. Also TINNING, GALVANIZING and JAPANNING.

ALEX. K. RARIG & CO.,
Founders, Machinists and Boiler Makers, Columbus, O.


A.K.RARIG & CO
COLUMBUS, O.
R.J.K.SMITH-CO.CIN.O.

Office and Works: Cor. Water and Chestnut Streets, near new Union Depot.

Steam Sewer Pipe and Tile Presses, Grinding and Tempering Pans, Sewer Pipe, Tile and Fire Proof Dies, etc.; Automatic Cut-off and Slide Valve Engines, Boilers, Pulleys, Hangers and Shafting, Steam Pumps, Pipe Fittings and Architectural Iron Work.

MONON ROUTE
LOUISVILLE, NEW ALBANY & CHICAGO RY.

The Shortest and most Direct Route from

INDIANAPOLIS
TO
Frankfort, Delphi, Monticello, Michigan City,
CHICAGO,

And all points in Northern Indiana, Michigan, Northern Illinois, Wisconsin, Iowa, Minnesota, Nebraska, Kansas, New Mexico, Dekota, Nevada, Colorado, California, and Oregon.

2 Through Solid Trains Daily

From Indianapolis to Chicago; also, Michigan City, Elegant Pullman Sleeping Cars on Night Trains. BAGGAGE CHECKED TO DESTINATION.

No route can offer you any better accommodations or lower rates than we can. Road and equipments first class. Steel Rails, Miller Platforms and Buffers, Air Brakes, and all modern improvements. Superior advantages to Western Emigrants. Land and Tourists' Tickets to all points reached by other lines. If you are going West, Northwest or North, do not purchase your tickets until you have seen our time folders or called upon us.

For full and reliable information, Tickets, or Sleeping Car Berths, please call on or write to

I D. BALDWIN, District Pass. Agent.
Office, 26 South Illinois St., Indianapolis, Ind.
E. O. McCormick, Gen'l Passenger Agt.
CHICAGO, ILLS.

THE PRINCIPAL AND BEST ROUTE TO THE WEST IS

The Vandalia Line,

And the reason for it being, is apparent to all those who travel between the East and the West. It's trains run solid from Indianapolis to St. Louis, and the service is conceded to be unequalled. Comfortable day coaches, that are kept tidy and clean, handsome and elegantly furnished parlor cars with easy sofa chairs go to make the trip from Indianapolis to St. Louis a pleasure rather than a hardship. Pullman sleeping cars are run on day and night trains, a local sleeper is also run for the convenience of local travel between Indianapolis and St. Louis, and passengers can get into the car at or near the Union Station any time after 8:30 P. M., and will not be disturbed until St. Louis is reached at 7:00 A. M. Rates are always as low as by less important routes. Through express trains run as follows: Leave Indianapolis 7:30 A.M., 11:55 A. M., 11:00 P. M. Arrive St. Louis, 5:00 P. M., 7:30 P. M. and 7:00 A. M., respectively.

Before making arrangements for a western trip, be sure to write or call upon.

H. R. DERING,
Ass't Gen'l Pass. Agent, Vandalia Line,
48 W. Washington St.,
INDIANAPOLIS, IND.

Queen & Crescent Route.

Cin. Southern and Associate Roads.

DIRECT

AND

Most - Picturesque - Route

SOUTH.

DOUBLE DAILY SERVICE OF

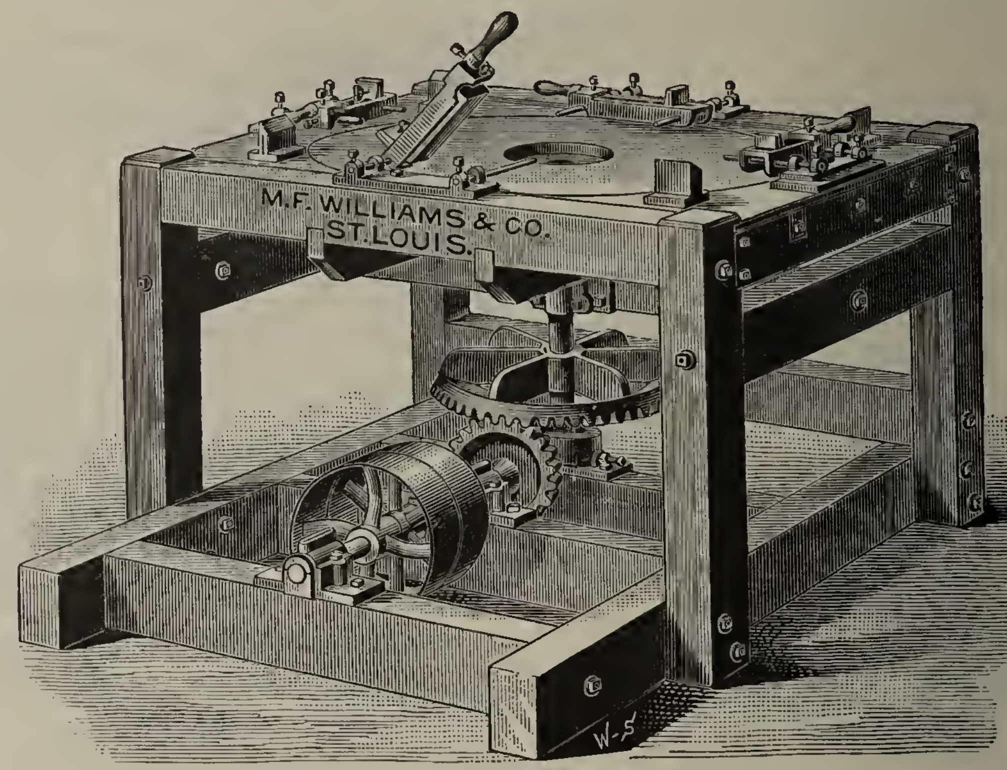
FAST THROUGH TRAINS
From Grand Central Union Station,
CINCINNATI,
For Chattanooga, Knoxville, Memphis, Birmingham, Meridian, New Orleans, Vicksburg, Shreveport, Mexico, Texas and California.

CINCINNATI TICKET OFFICES:
West Fourth Street near Vine, and Grand Central Union Station.

OHN C. GAULT, Gen'l Manager.
R. CARROLL, Gen'l Superintendent
D. G. EDWARDS, Acting General Pass. Agent, Cincinnati.

Williams' Sizing Machine for Dry Press Brickmakers

PATENT PENDING.


M.F. WILLIAMS & CO.
ST. LOUIS.
W-S

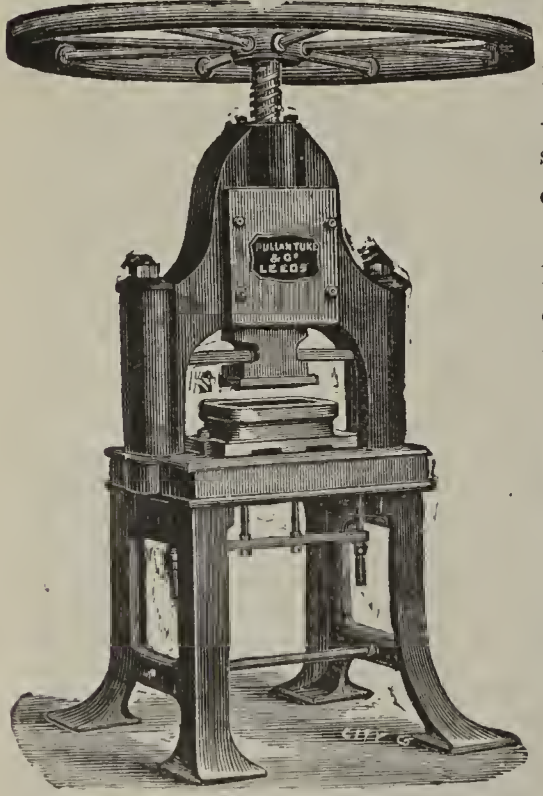
PATENT PENDING.

The above cut represents **Williams' Sizing Machine** for shaping Brick that cannot be shaped upon the Dry Press, such as **Arch Brick, Triangular Brick** and Brick for **Obtuse** and **Acute Angles.** This machine is operated by 4 boys; the grinding medium being sand and water, which is fed onto the wheel through a sluice box not shown. The clamps will accomodate any shape desired, the bottom of clamp being hinged, and is adjustable to any shape. Putting in and taking out the brick requires but a moment; only one thumb-screw to operate. The clamps, guides and rests are all adjustable and very simple and durable. The upright shaft is adjusted by the tallow pot below, which keeps the wheel always in tram. The wheels are made thick enough to admit of refacing at least six to ten which should be done every season in order to insure even work.

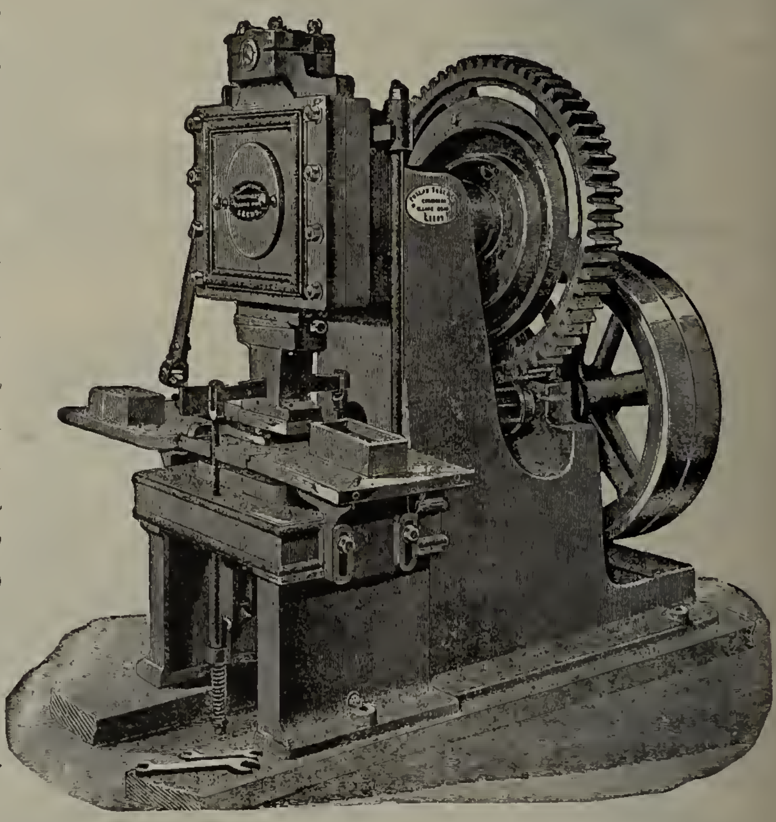
For prices and further information inquire of the Sole Manufacturers,

Milton F. Williams & Co.,
1417 and 1419 N. 2nd St. St. Louis, Mo.

Titlev's Patent Screw Press.



Pullan, Tuke & Gill's Patent Steam Press



WE beg to call the attention of Brick, Tile and Terra Cotta Makers to these two Presses as the *Peers of any press on the market* for superiority of finish in the work produced.

The *Steam Press* is best adapted to large works and will produce the best quality of Front Bricks. Its capacity is 10,000 per day of the finest bricks at the smallest cost for labor. For small works and for all makers of moulded and ornamental bricks, tiles and terra cotta, we recommend the *Screw Press.* It will exert a pressure of 30 tons and is to-day *without a rival* the *best press on the market.* Its capacity is 3,000 to 4,000 plain brick per day.

Send for circulars giving all information, with testimonials.

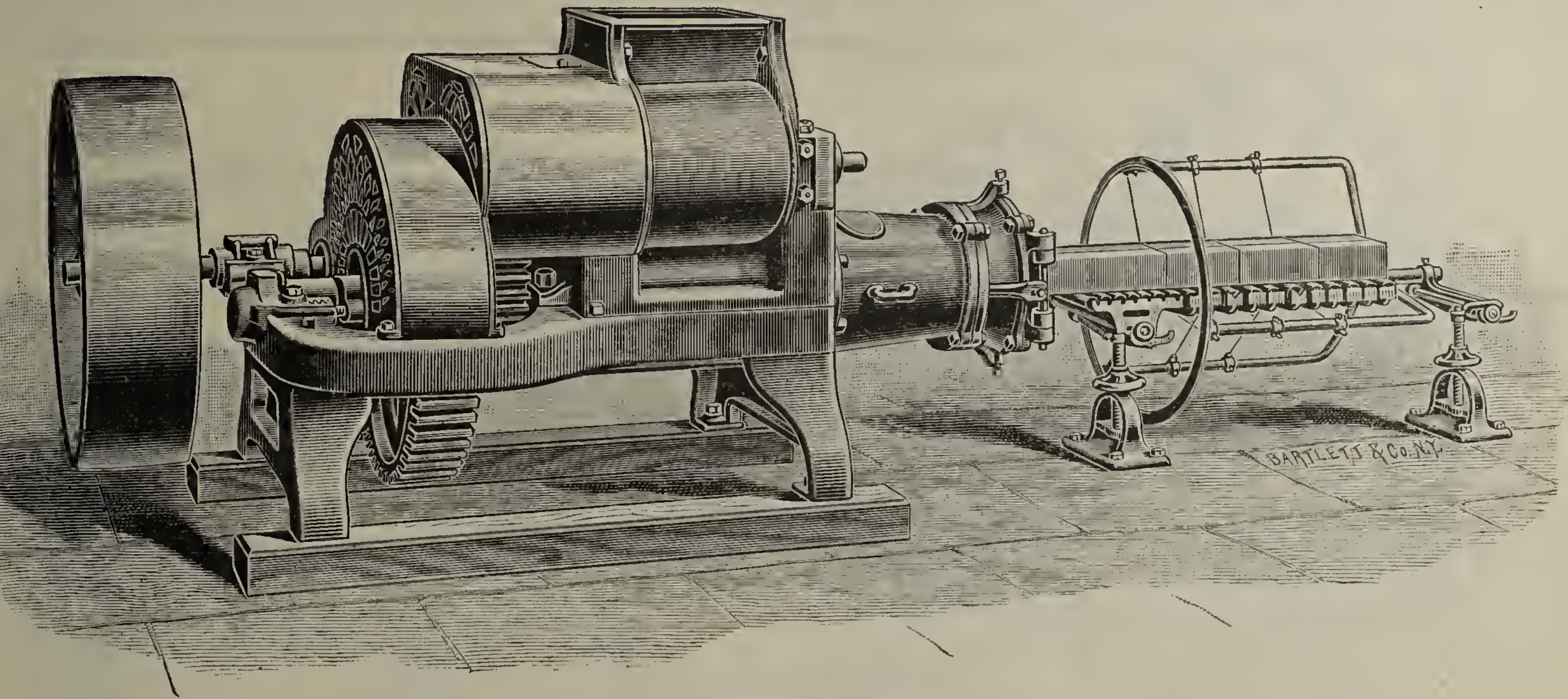
ALFRED CROSSLEY,

Sole Agent for the United States. **Chattanooga, Tenn.**

(Mention the Clay-Worker.)

THE OHIO BRICK AND TILE MACHINES.

Now Built in Three Sizes to Meet the Requirements of Different Manufacturers.


BARTLETT & Co. N.Y.

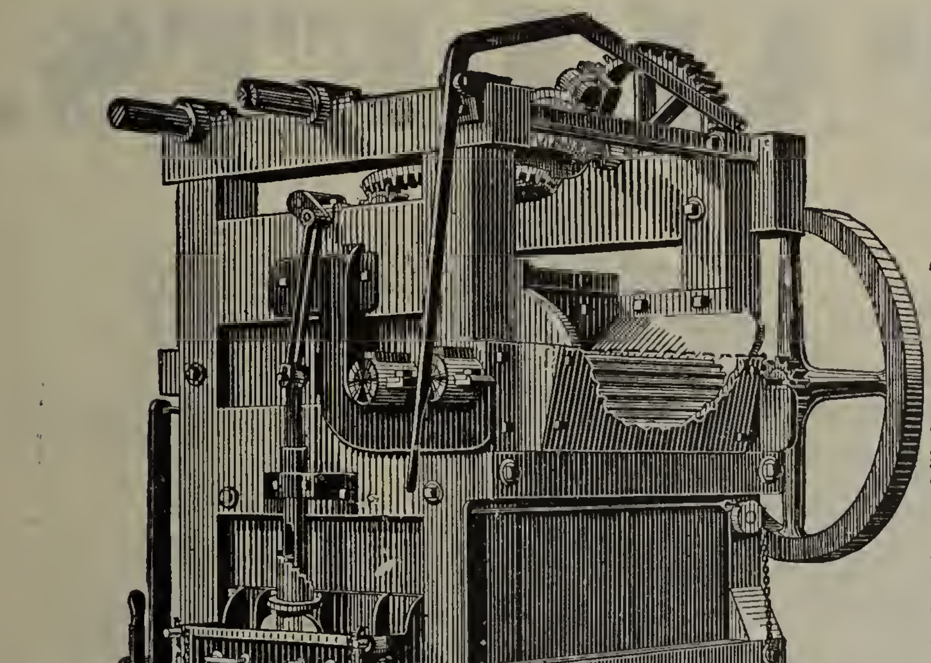
"B" or Medium Size Machine.

Clay Crusher combined with each machine. The A and B sizes of new design, and built with special reference to strength and durability, the heaviest strains being received on wrought iron bars instead of castings. Either size makes end or side-cut brick and tile up to 15 inches. Lubricating brick dies. Cutting tables for both brick and tile superior to all others. Satisfaction guaranteed.

☞For Catalogue and particulars, address

FATE & FREESE,

[Mention this paper. **PLYMOUTH, Richland County, OHIO.**


Raabe Eng. Co. Milw.

GURNEY
BRICK MACHINE WORKS,

MILWAUKEE, WISCONSIN,

Manufacturers of

THE GURNEY BRICK MACHINE

——Having Crushers Inside of Pug Mill.——

THIS is the only Machine in use which has the *combination of Crushers, Mixing and Moulding Apparatus* in a single machine. The arrangement is covered by patent issued October 6, 1885.

This machine will work any clay, however hard and lumpy, with no preparation before soaking in the usual way. The Crushers will take the clay through as fast as the machine will turn out the brick, *doing entirely away with lumps*, which brickmakers know have been much in the way of making good brick, and also have caused great loss by breakage.

The Machine will turn out four thousand, or more, good, smooth, square brick an hour. With proper moulding sand THE BRICK FROM THIS MACHINE, *made from any clay*, WILL SLIP EASILY. The Machine has been thoroughly tried in different parts of the country.

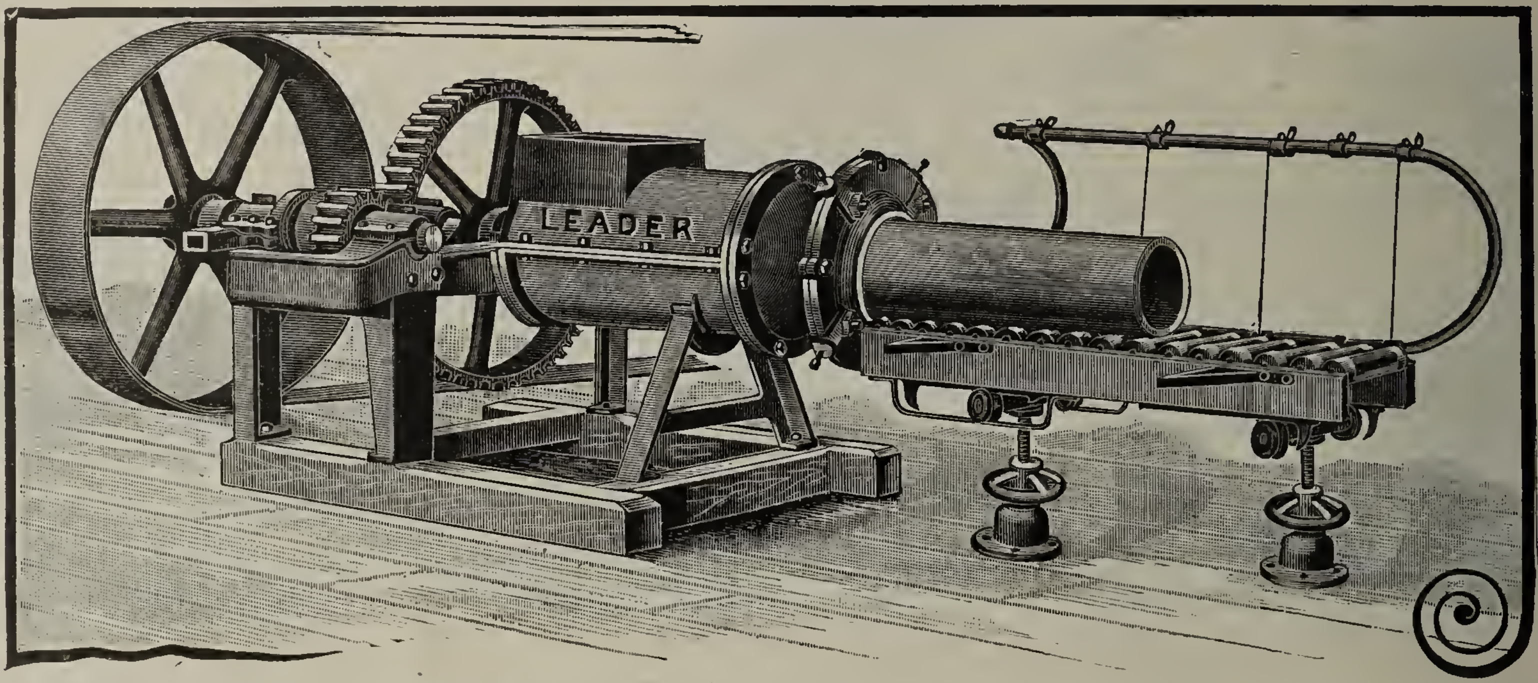
Also First-Class STEAM and HORSE-POWER MACHINES of same pattern, without Crushers.

For further information and Illustrated Catalogue address—

T. C. GURNEY,

100 Wisconsin St., MILWAUKEE, WIS.

THE LEADER BRICK AND TILE MACHINE.



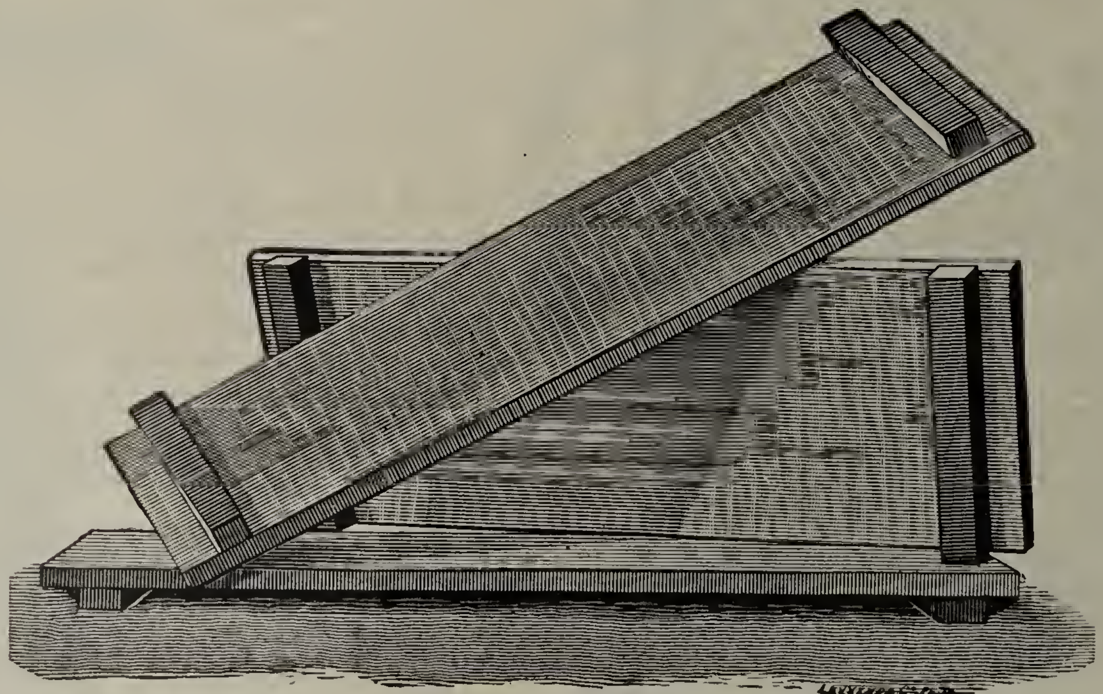
We manufacture the very latest and best designs of Tile Machines, Brick Machines, Clay Crushers, Elevators, and Dump Cars for handling clay by steam. Design special clay-working machinery to order. Have a large stock of the best cutting wire. Correspondence solicited.

BROWN & HARROP MFG. CO.,

Geo. S. Pollock, Agent, Sullivan Ind PORTLAND, IND.

BRICK PALLETS.

Brick Pallets.



Brick Pallets.

PIPE BOARDS, ROOFING LUMBER Supplied Direct in Carload Lots.

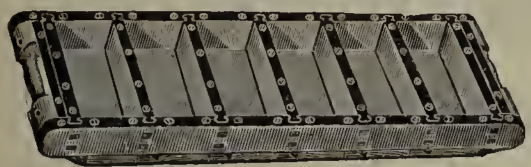
When writing for prices, give an exact description of the kind of pallet wanted, as different pallets are in use in different sections of the country. State whether cleats are to be nailed on; also length, width and thickness of the pallet. **We have a big trade in this line and can save you one profit. Write for prices.**

W. B. MERSHON & CO.,

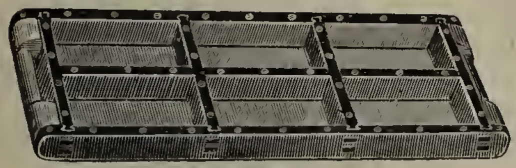
Manufacturers of all kinds of white pine lumber and packing boxes in shooks.

East Saginaw, Mich.

6 B. MACHINE MOULD.



6 B. HAND MOULD.



3 B, HAND MOULD.

D. J. C. ARNOLD,

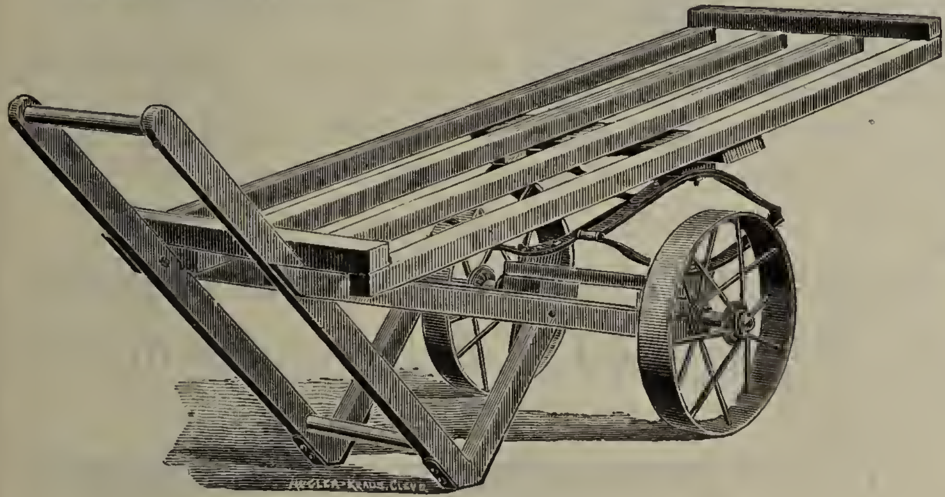
MAKES ∴ BRICK ∴ YARD ∴ SUPPLES

At NEW LONDON, OHIO.

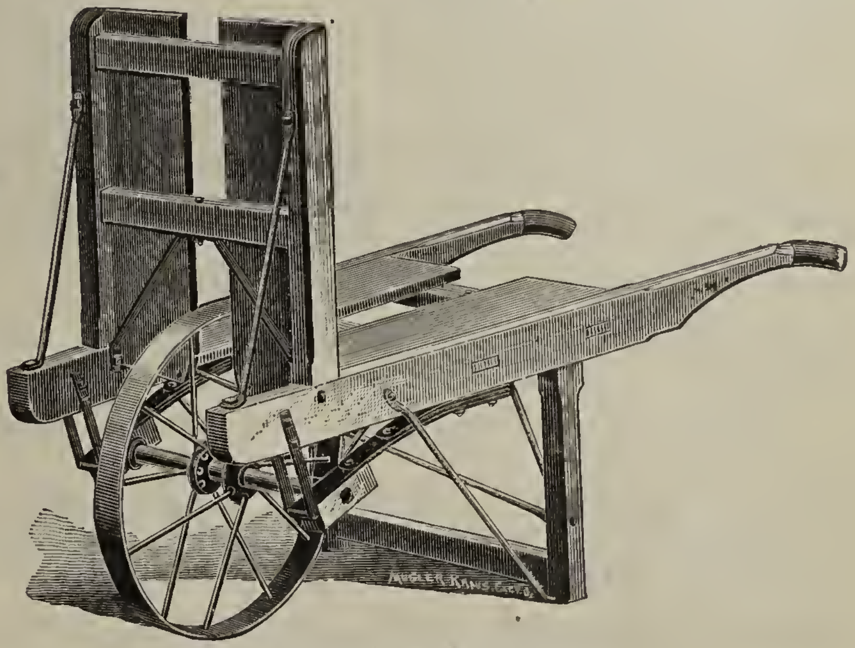
Get his prices before you buy. All goods first-class in every respect.

[Mention the Clay-Worker.]

☞Catalogue sent on application.



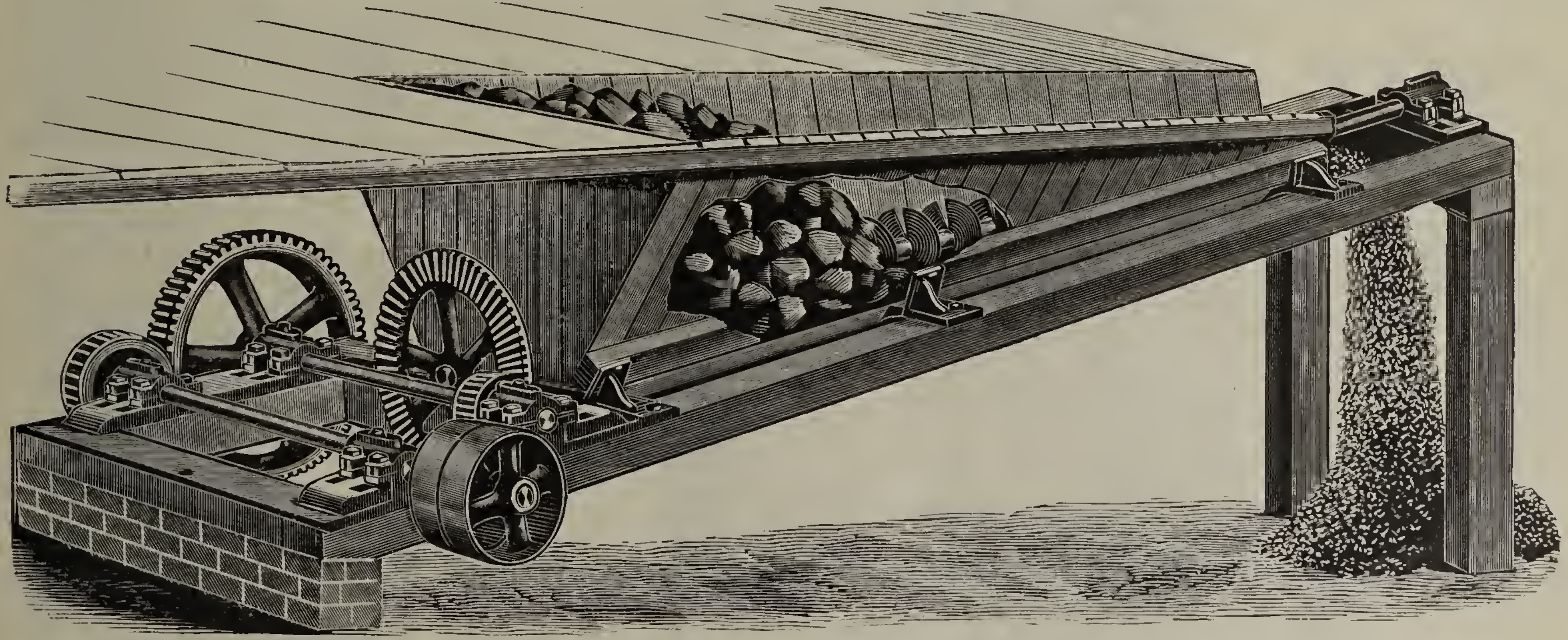
NO. 10 SPRING TRUCK.
(Weight 100 pounds.)



NO. 1 BRICK BARROW.
(Weight with springs 100 lbs.)

Emen's Patent Perfection Clay Granulator and Feeder.

SOLD SUBJECT TO TRIAL AND APPROVAL.



Saves time and labor and produces better ware; simple in construction; rapid and accurate in operation. Every brick, tile and sewer pipe manufacturer should investigate the merits of this machine.

During the past season it was introduced in several of the leading Chicago brickyards and is now at work giving entire satisfaction. Write for descriptive circulars.

Chambers Brothers Company, of Philadelphia, Pa., are licensed to manufacture and sell these machines.

EMENS AND COLE

[Mention Clay-Worker.] HOLTON, (MUSKEGON CO.) MICH.

THE STANDARD BRICK MACHINES

—MANUFACTURED BY—

A. M. & W. H. WILES,

Grassy Point, Rockland County, New York.

These Moulding Machines have been in constant use for over 30 years, and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

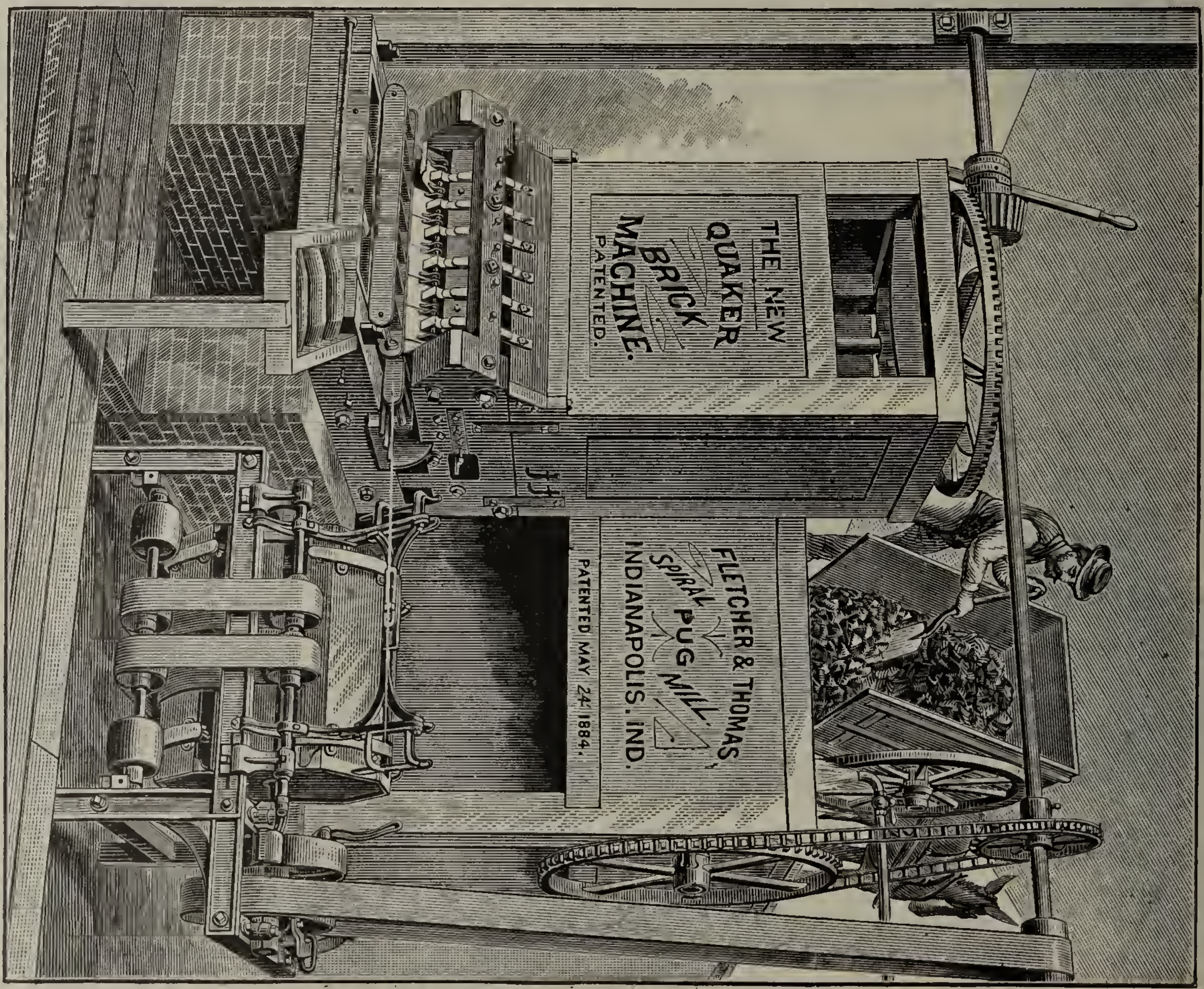
Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.

This outfit will make the largest number of the very best of Pallet Bricks at LeastCost of anything in the market. For further particulars address


THE NEW QUAKER BRICK MACHINE. PATENTED.
FLETCHER & THOMAS' SPIRAL PUG MILL INDIANAPOLIS, IND.
PATENTED MAY 24 1884.

BENNETT BROS. & CO., Wellington, Lorain Co., Ohio,

STEDMAN'S IMPROVED
Disintegrator and Pulverizer.

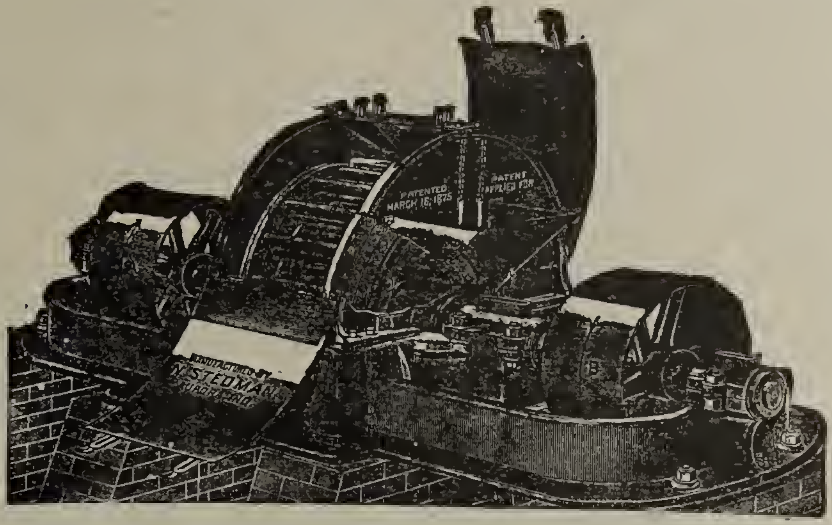
This mill will disintegrate or pulverize the following materials:

Clays of all kinds, Shale and Slate direct from the bank, for Brick and Tile.

Fire Clay and Sand Stone Rock—for Cement and Fire Brick.

Iron Ores of various kinds, Guano, Phosphates, Bones—green, dry steamed, Tankage, Rone-Ash, Salt Cake, Soda, Cracklings, Oyster Shells, Animal Matter in almost all conditions, Old Fire Brick and Tiles.

Old Pottery Ware, Plastic Clay, Asbestos, and in fact almost any material that can be disintegrated.



A good Disintegrator and Pulververizer is a long felt want in many branches of business. This Mill is an improvement over any yet made and is the result of practical experience.

This Mill is made in three sizes: 34, 40 and 48 inches. The capacity for clay is as follows:

34 inch Mill will pulverize for from 15,000 to 25,000 brick per day.

40 inch Mill will pulverize for from 20,000 to 35,000 brick per day.

48 inch Mill will pulverize for from 75,000 to 100,000 brick per day.

To Brick, Tile and Pottery Men and to Terra Cotta Works this Mill is invaluable. It reduces the clay to a fine, light and soft condition, with its full adhesive properties retained.

For Prices and any other Information, Address

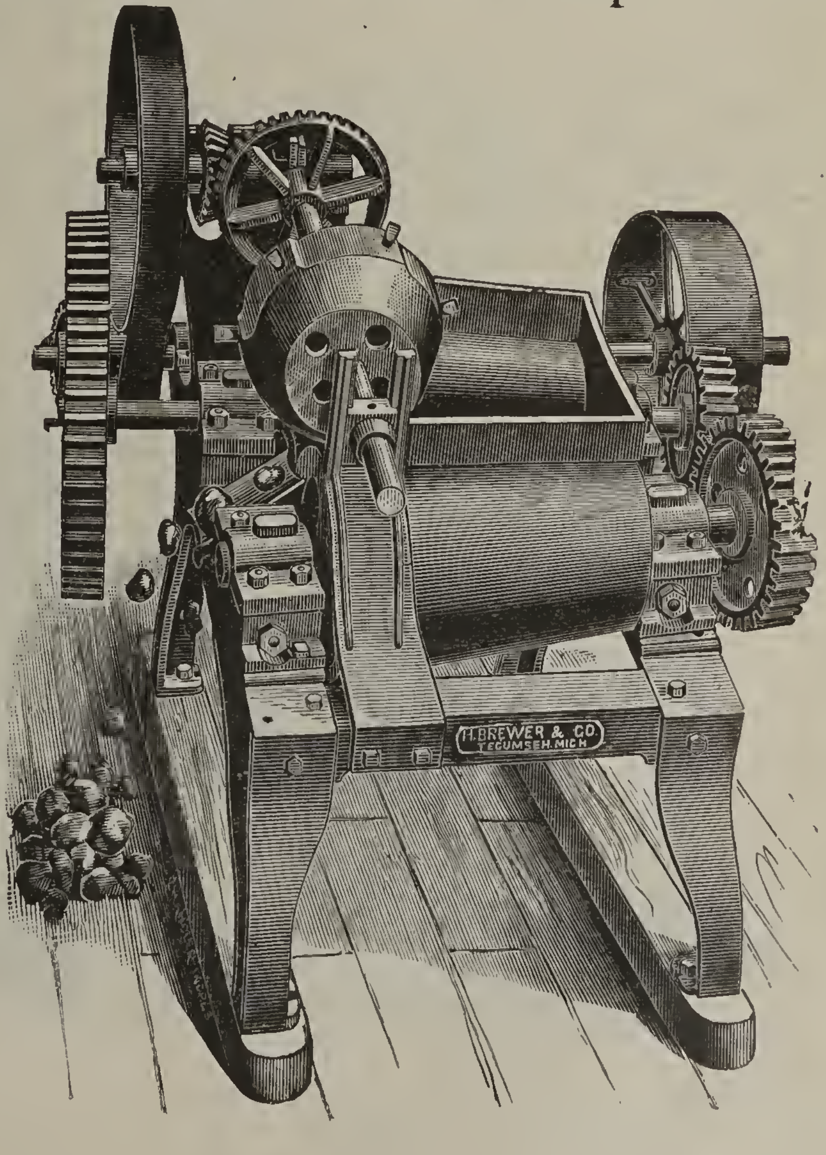
Stedman's Foundry and Machine Works,

PROTECTED BY PATENTS.
[Mention the Clay-Worker.]

AURORA, IND.

H. Brewer & Co's. Clay Crusher and Stone Separator.

The prominent feature in this Crusher is the combination of two smooth, tapering crushing rolls, running at different speeds, in connection with an adjustable transverse roll which is of irregular form and provided with teeth or spurs, whereby the clay is rapidly broken up and crushed, and the stones separated therefrom.


H. BREWER & CO.
TECUMSEH, MICH.

TESTIMONIALS.

Saunemin, Ills., May 18th, 1888.

H. Brewer & Co., Gentlemen—Your Crusher works to a charm and we are very highly pleased with it. It runs one-half easier than any other Crusher we have had.

Yours Truly,
SAUNEMIN BRICK AND TILE CO.

Budd, Ills., May 3d, 1888.

H. Brewer & Co., Dear Sirs—The Crusher and Elevator work to my entire satisfaction. I feel confident I would be $2,000 ahead, to-day, had I put in your Machine and Crusher at the start.

Yours Truly,
HENRY SIEDENTOP.

Monroe, Iowa, May 15th, 1888.

H. Brewer & Co., Gentlemen—The Crusher is giving good satisfaction and I think will do all that is claimed for it.

Yours,
T. P. BURCHINAL.

☞Do not fail to obtain our prices on Tile Machines, Brick Machines, Pug Mills, Clay Crushers, etc. For illustrated Catalogues and Price List, address

H. BREWER & CO.,

(Mention Clay-Worker.)

Tecumseh, Mich.

ATTENTION, TILE-MAKERS.

Such improvements have lately been made in the production of Porous Earthenwares that the power and facilities usually afforded by the common drain tile manufactory will enable a manufacturer to step into a new and profitable business, protected from competition, at an outlay not exceeding that already invested in his plant, by more than One Thousand Dollars.

Shop rights or Territorial rights upon a royalty basis supplied by

The International Terra-Cotta Lumber Co.,

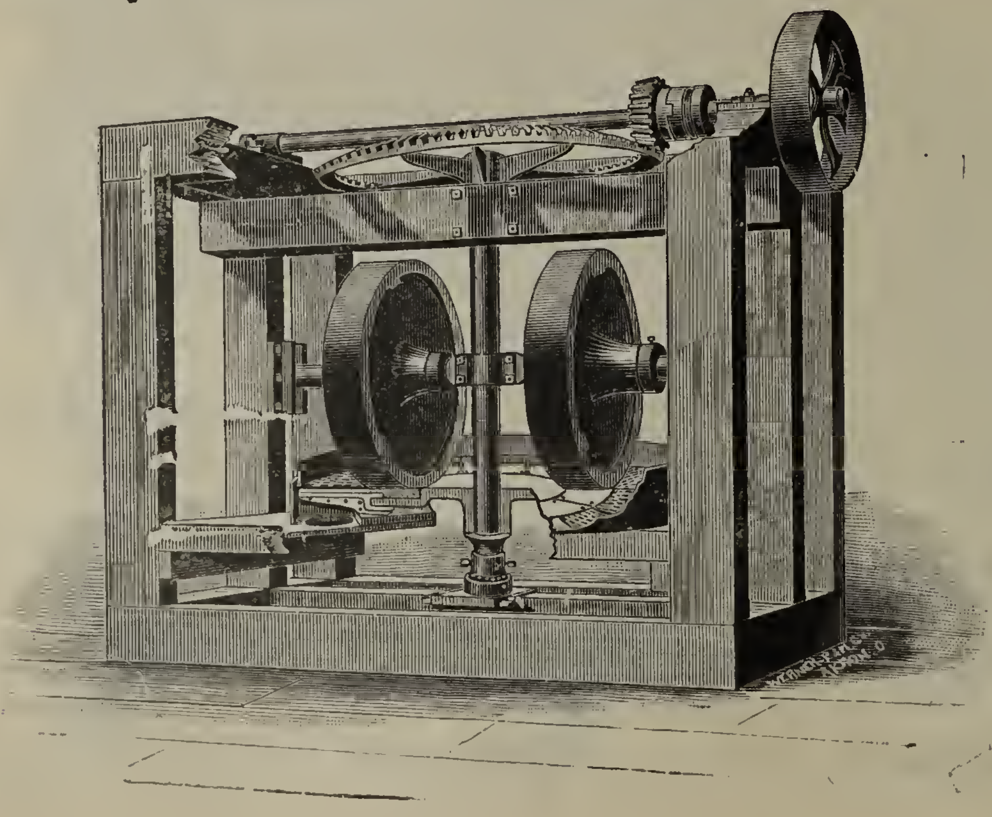
115 DEARBORN STREET, CHICAGO, ILLS.,

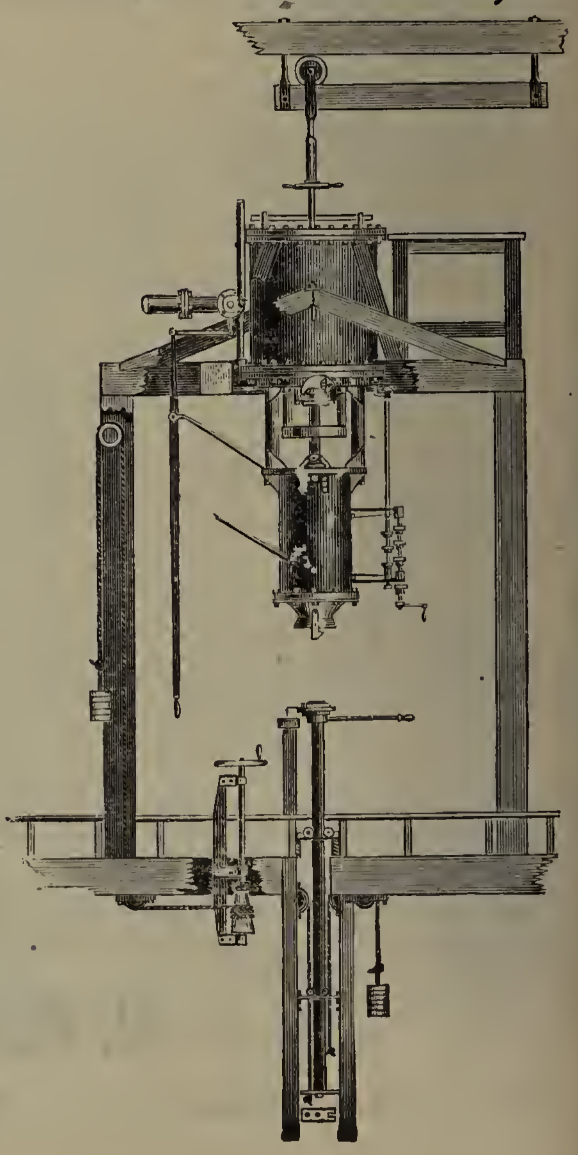
to whom all applications and correspondence should be addressed.

TAPLIN, RICE & CO.,

AKRON, O.

Manufacturers of Improved Clay Working Machinery of all kinds, such as Clay Mills, Dry and Wet Pans, the Barber Steam Sewer Pipe Press, Dies, Clay Blockers, Potters' Wheels and machinery of every description. Write for circulars.

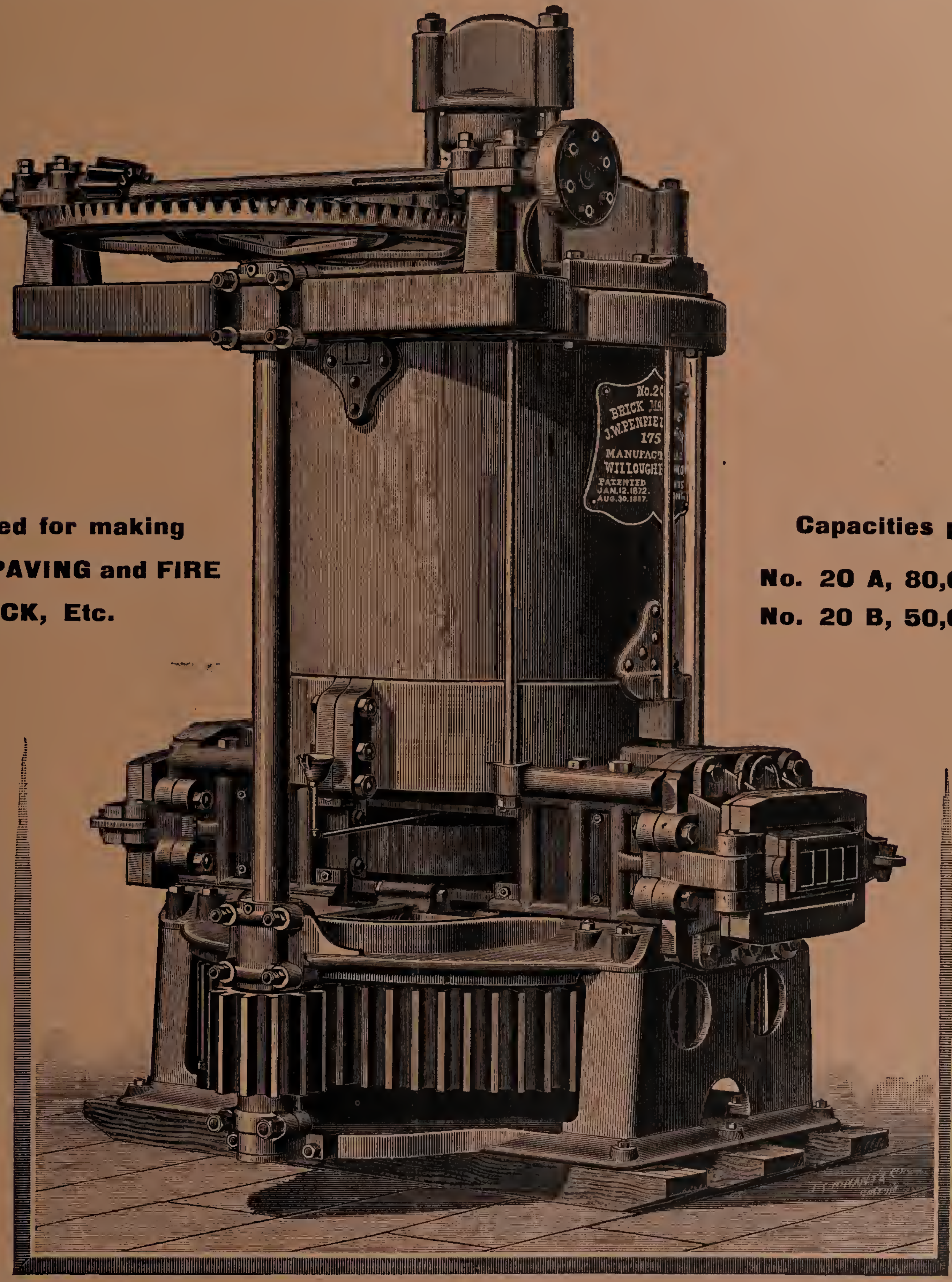




THE PENFIELD BRICK MACHINES

No. 20, A. & B.

The -:- Largest, -:- Strongest, -:- and -:- Best -:- Brick -:- Machines -:- Made.



Unexcelled for making
COMMON, PAVING and FIRE
BRICK, Etc.

Capacities per day:

No. 20 A, 80,000 Brick.
No. 20 B, 50,000 Brick.

—WE MANUFACTURE—

Brick Machines; Tile Machines; Pug Mills; Clay Crushers and Stone Separators; Granulators; Elevators; Kiln Castings; Yard Supplies. Pulleys, Shafting, Hangers, Couplings, Etc., Etc.

☞ *Complete Outfits* of any desired capacity a specialty. For full particulars address the manufacturers,

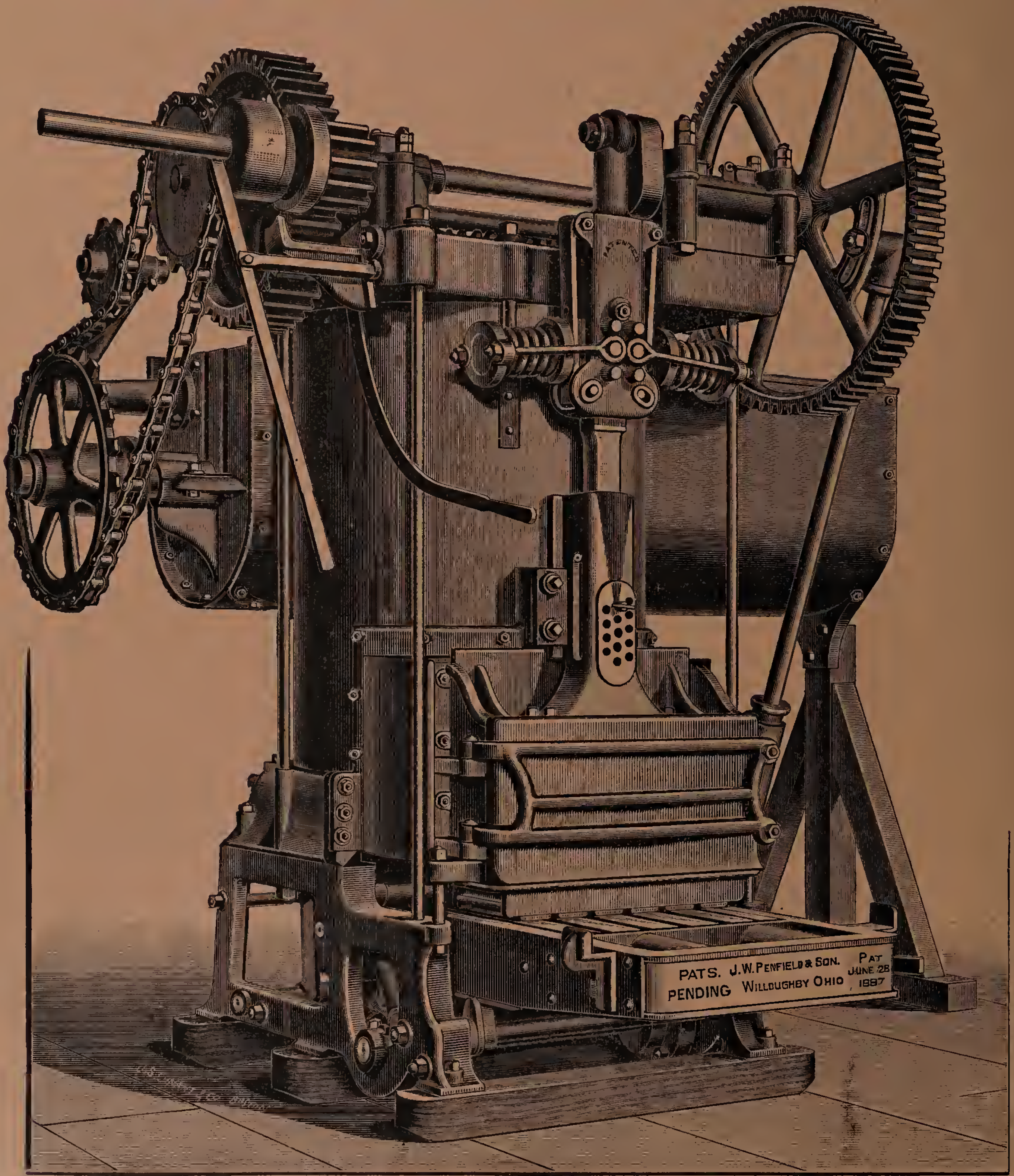
J. W. PENFIELD & SON, - - Willoughby, Ohio, U. S. A.

THE PENFIELD

Upright Stock Brick Machine.

WITH DIRECT-ATTACHED PUG MILL.

Every Brickmaker should send for full particulars of this machine.



This Machine is furnished with or without pug mill, as desired.

The Strongest, Most Practical and BEST Sand Moulding Machine made.

All Iron and Steeel; No wooden parts to decay; Extremely heavy; Perfectly rigid; Light running; Has separate gearing for doing the pressing and pugging; Makes **six** of the largest sized brick in each mould.

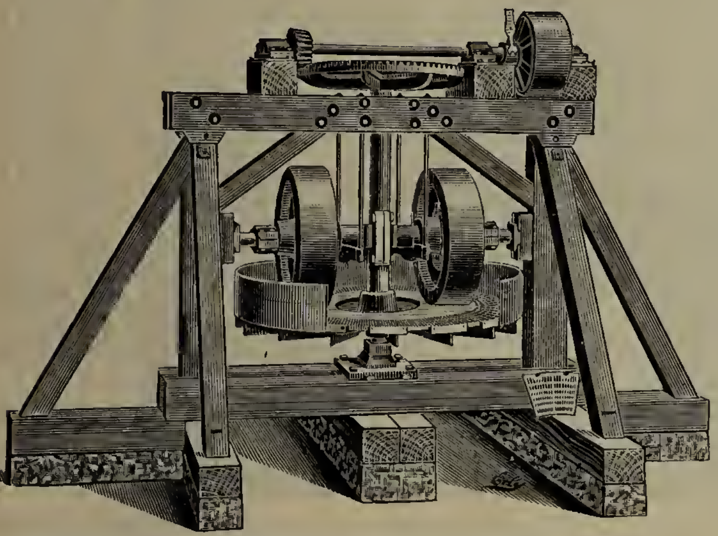
All the brick are perfect in shape, with good sharp corners, in fact **perfect stock brick.**

All the brick are of equal density, and if repressed will make first-class pressed brick, **ALL UNIFORM IN SIZE.** Address the Manufacturers,

J. W. PENFIELD & SON,

[Mention the Clay-Worker.] WILLOUGHBY, OHIO. U. S. A.

THE FROST
Dry & Wet-Pan Crushers, Chasers, Etc.,



—FOR—

BRICK, TERRA-COTTA, SEWER PIPE AND FIRE CLAY.

—o—

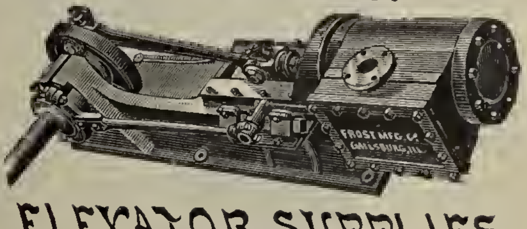
The best and cheapest machines made for working hard clay, soap stone, grog, etc.

Write for prices and other information.

THE FROST ENGINE CO.

GALESBURG, ILL.

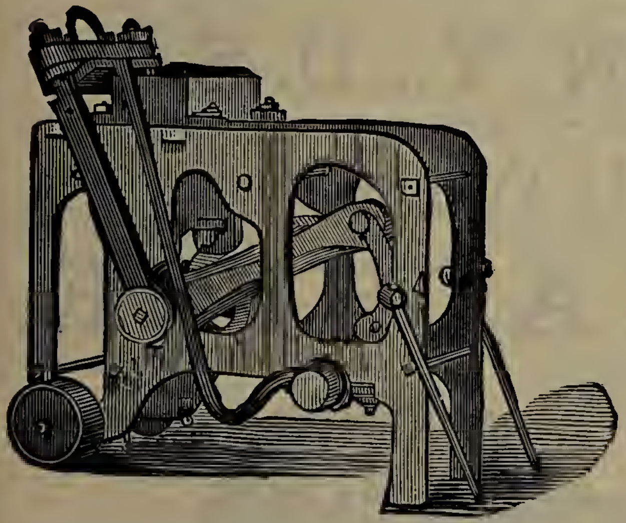
ALL SIZES UP TO 150 H. P.


FROST MFG. Co. GALESBURG, ILL.

ELEVATOR SUPPLIES

PULLEYS, SHAFTING, SPROCKETS, BUCKETS, BELTING, SHELLERS, CLEANERS, MILLS, &c.

SEND FOR CATALOGUES



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1819 and 1821 Germantown Avenue, and Fifth St.,
PHILADELPHIA, PA.

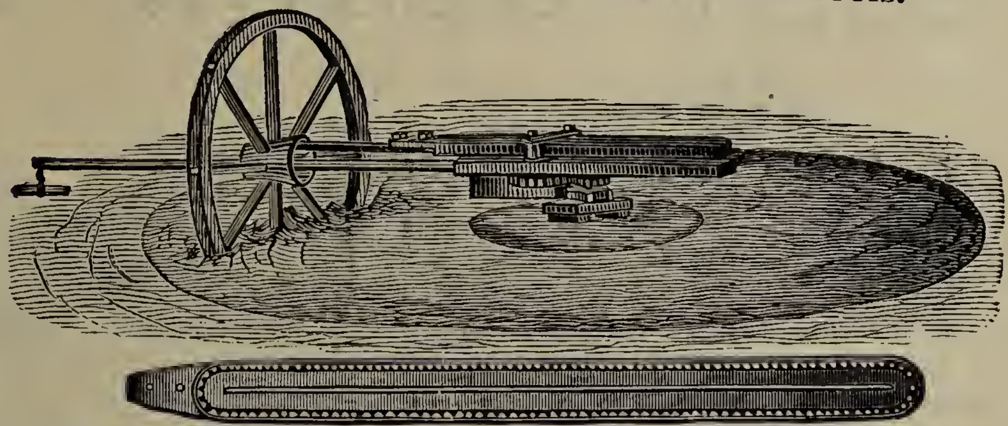
☞Send for Circular and Price-List.

Philadelphia Brick Machine Works

—MANUFACTURER OF—

FIRE AND RED BRICK PRESSES.

Various sizes, from the smallest size up to 24 inches; also, manufacturer of **Clay Mills, Tempering Machinery,** and all kinds of **Brickmakers' Tools.**



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and is fitted up ten per cent. cheaper. ☞Mention THE CLAY WORKER.

ESTABLISHED 1812,
AND CONTINUED ON THE SAME PREMISES EVER SINCE,

MILLER'S
BRICK PRESSES,

Introduced 1844 Latest Improved Patents, Aug. 28, 1883.

SAMUEL P. MILLER & SON,

MAUFACTURERS OF

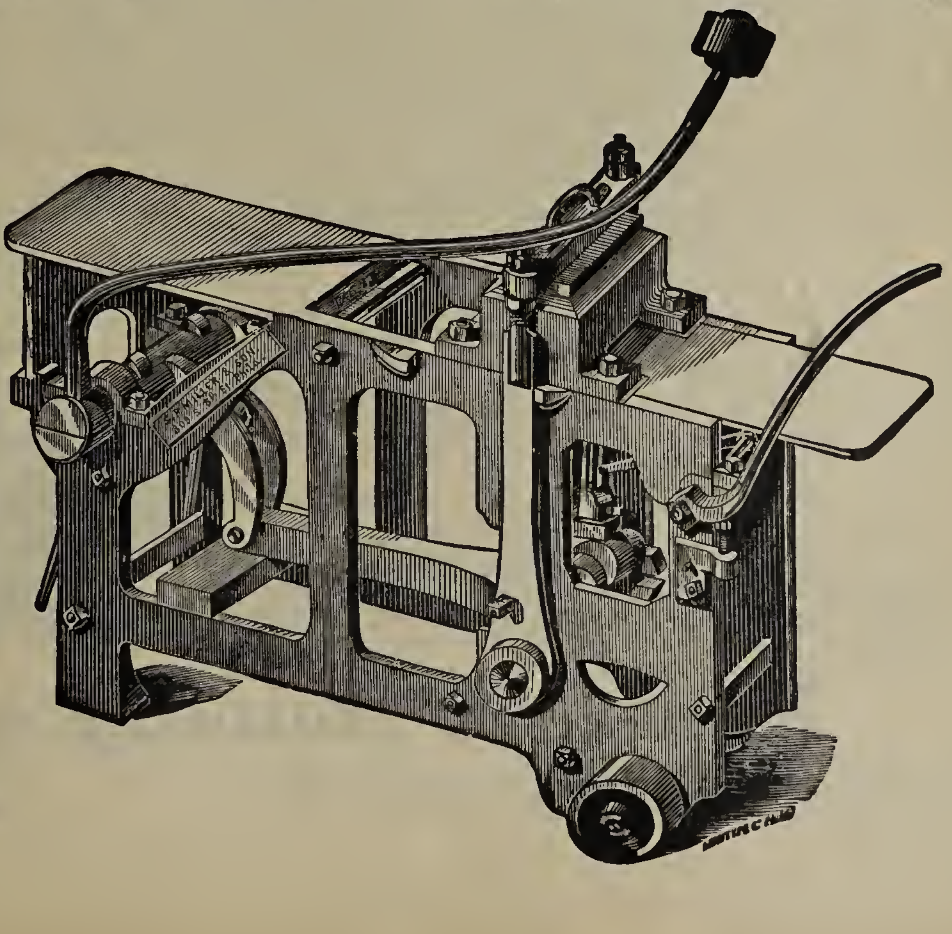
RED AND FIRE BRICK PRESSES,

Of five different styles, embodying all the improvements in Hand Brick Presses in use.

Clay Wheels with Reciprocating Rack, Kiln Castings, Brick Moulds, Clay Spades, and the Tools in General Use for Brick Making.

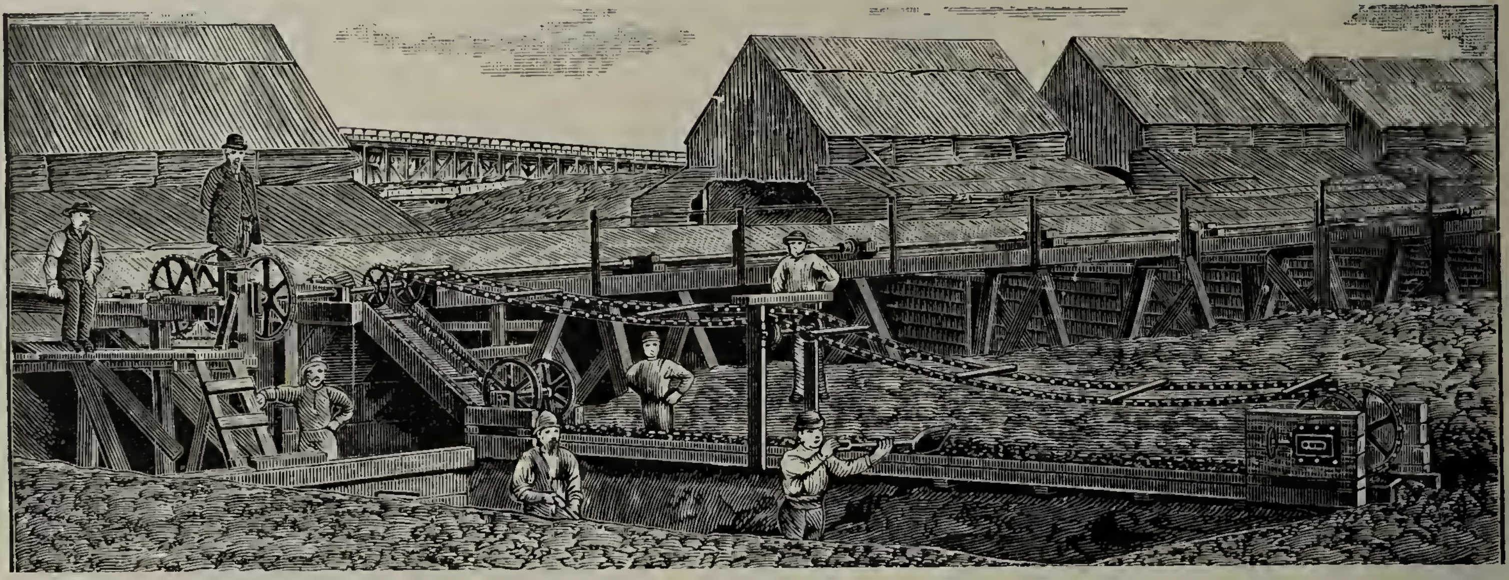
No. 309 SOUTH FIFTH ST., PHILADELPHIA, PA.

S. P. M. & Son refer to Brickmakers generally. ☞ Orders from abroad promptly attended to.



MEY'S CLAY ELEVATOR AND CONVEYOR,

This Elevator is for taking the clay into the brick machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.



It gives the machine a uniform feed, takes less power and manual labor to manipulate and the manufacturer is enabled to make many more thousands of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

It will carry either wet or dry clay and does not clog. There are many of them now in operation and giving satisfaction in every respect. For further particulars and for Catalogue, address

F. H. C. MEY, BUFFALO, N. Y., U. S. A.

THE NEW IMPROVED
CHIEF BRICK MACHINE.

Patented Jan. 1, 1884, *April* 2, 1884, *and the new improvements of* 1887 *and* 1889.

Has taken the lead and stands at the head of all Brick Machines, and is now in operation in every State and Territory in the Union.

In its original construction it was exhibited and operated at the great Southern Exposition at Louisville, Ky.; also at St. Louis, Mo., Kansas City, Mo.; Indianapolis, Ind.; Columbus, O.; Cincinnati, O.; Chicago, Ill.; and at each and all places where premiums were awarded the CHIEF carried off the first prize medal over all competitors.

And with the late new improvements added the CHIEF stands in perfection, at the head of human inventions.

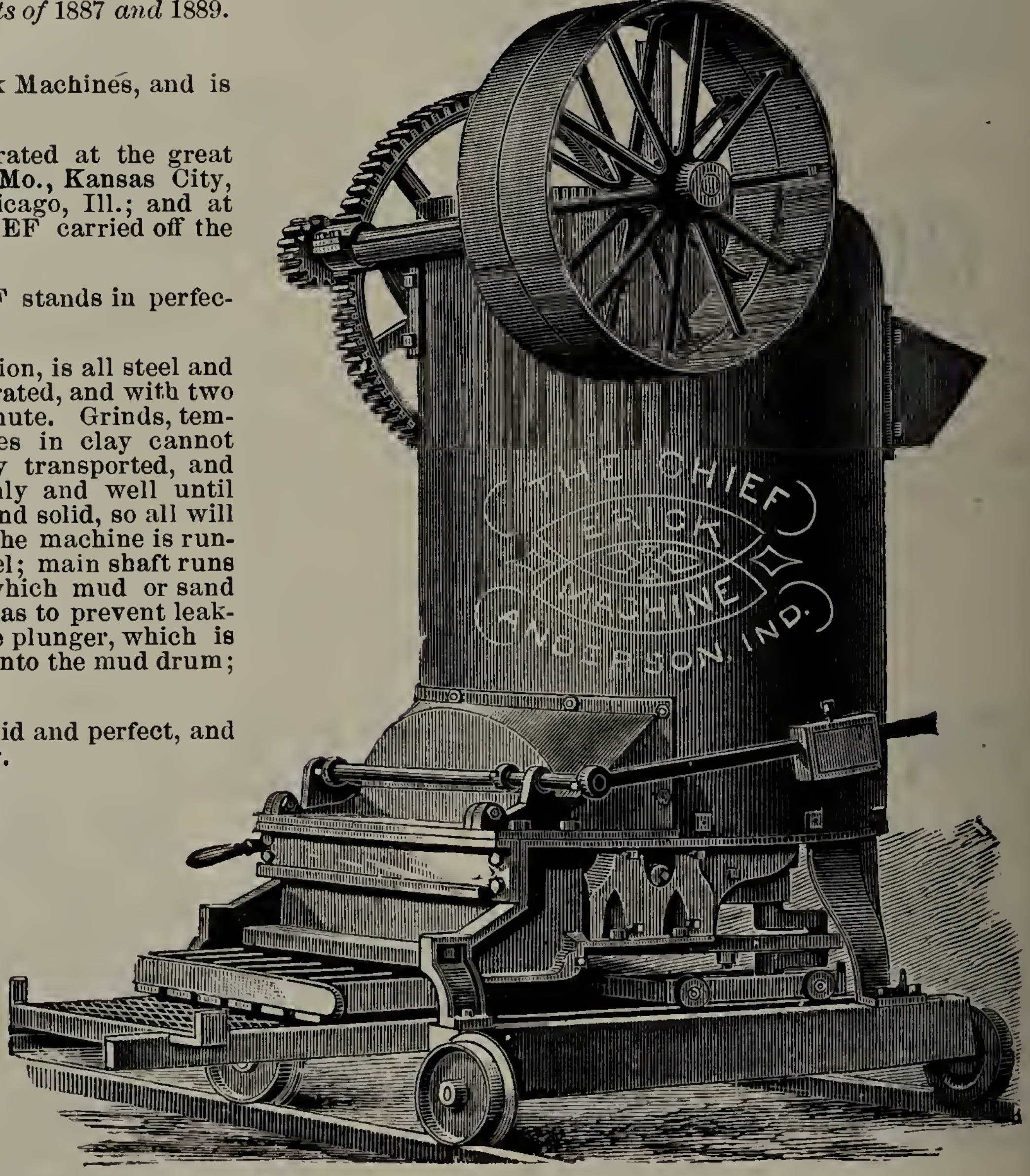
The NEW IMPROVED CHIEF is wonderful in operation, is all steel and iron, and of the greatest strength and durability, is easilyoperated, and with two horses or a small engine makes 60 to 100 perfect bricks per minute. Grinds, tempers and at the same time moulds into brick any clay. Stones in clay cannot break it, nor interfere with its free operation. It is easily transported, and changed from horse to steam power. It fills the moulds evenly and well until the machine is empty of clay, pressing each brick equally and solid, so all will shrink alike. The pressure can quickly be changed while the machine is running to suit the consistency of the clay. All shafts are of steel; main shaft runs in three boxes or bearings all outside of the machine into which mud or sand cannot penetrate. The wear can at all times be taken up so as to prevent leakage. The clay in the press box is under full control of the plunger, which is direct and positive, and prevents the mud from floating back into the mud drum; this feature is not found in any other mud machine.

Bricks made by the NEW IMPROVED CHIEF, are solid and perfect, and have sharp edges and corners, and do not crumble in burning.

The NEW IMPROVED CHIEF is equally suitable either for small or large yards, the best of bricks are made by it at the least labor and expense, all parts are easy of access and the bearings can be oiled from the outside. All ordinary sizes of brick as well as ornamental brick can be made on the NEW IMPROVED CHIEF and it is especially adapted to making fire brick of any shape with the least danger of breakage and the smallest per cent of lost brick.

The NEW IMPROVED CHIEF is sold on its merits, and warranted to be all that is claimed for it.

We will send Circulars and Testimonials of the NEW IMPROVED CHIEF BRICK MACHINE, New Departure Tile Machine, Engines, Etc., Etc., free to any address on application. Address



Anderson Foundry & Machine Works,

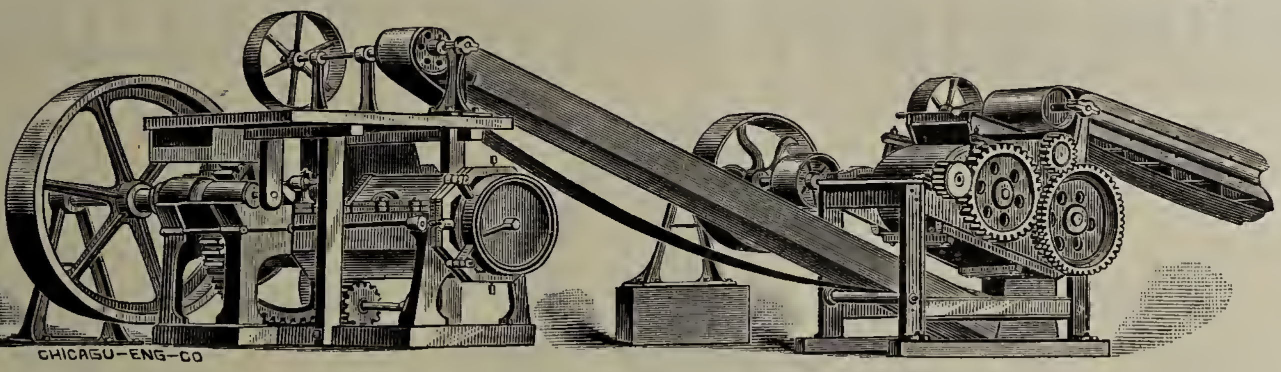
Mention the Clay-Worker.

Anderson, Indiana.

Adrian Brick and Tile Machine Co., Adrian, Mich.,

—MANUFACTURERS OF—

Brick and Tile Machinery,



Clay Crushers,
Engines
and boilers.

Also Daso's Builders' and Contractors' Elevators. Steam Fittings and Iron and Brass Castings Furnished to Order.

The working qualities of our machinery at its present state of development as estimated by one of the prominent Brick Manufacturing Companies of Kansas City, are stated in the following reply to a letter of inquiry addressed to them:

KANSAS CITY, MO., August 21, 1888.

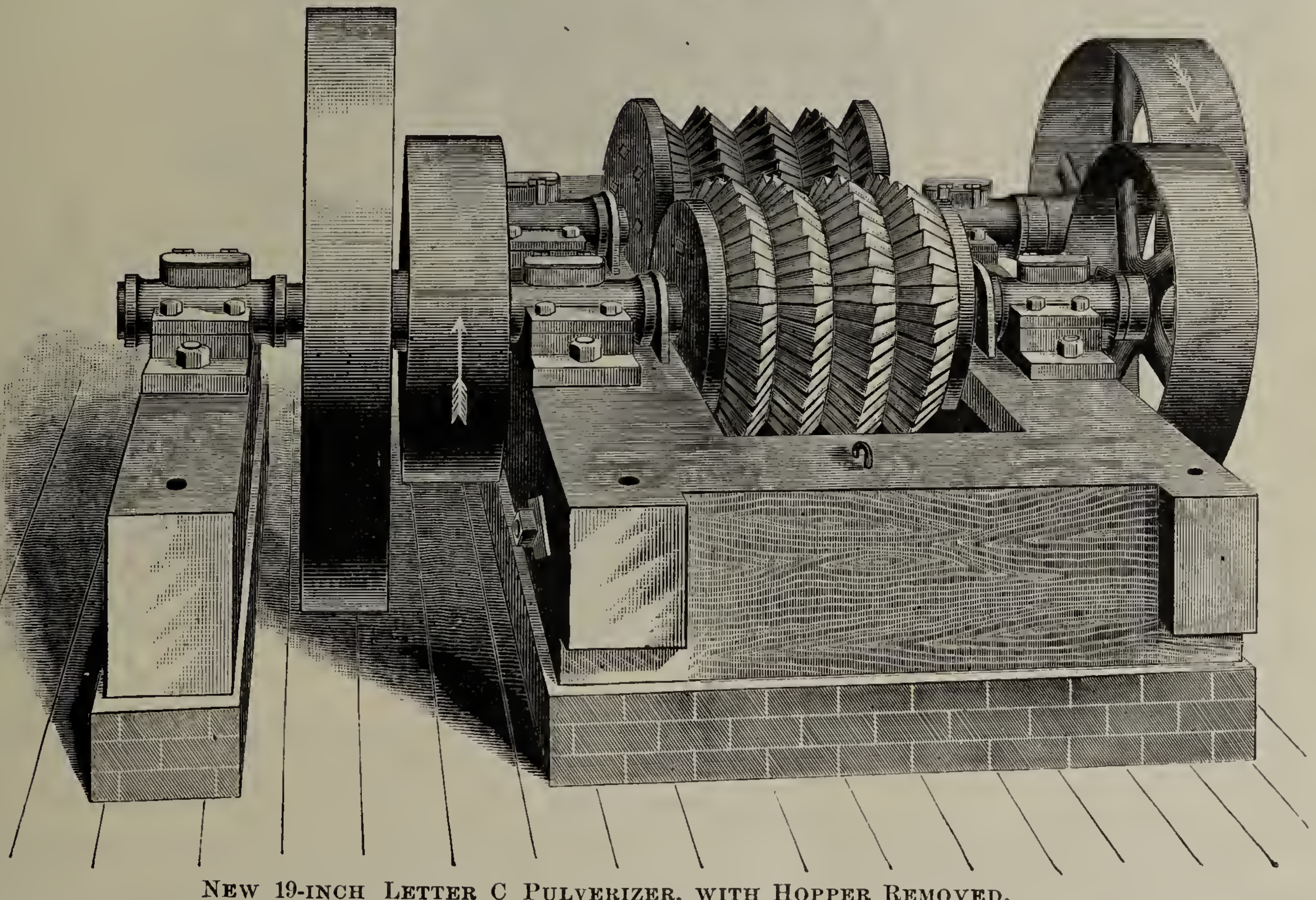
JOHN GIBSON, Esq., Monticello, Iowa:

DEAR SIR—In answer to your favor of the 16th will say, that we do not think there is any room for improvement in the Adrian Brick and Tile Machine Co's No. 4 Cut-off Table, as it cuts the brick as near perfect as possible, without tearing the edges; thus leaving the ends of the brick as perfect as the face. We are also using the new dies on both our machines, and are well pleased with them, as they are 100 per cent. better than the old style and turn out a perfect column of clay without warping or twisting. We have two No. 3 McKenzie machines and they are doing excellent work for us and we averaged during July, 26,800 brick, each, per day. In conclusion we will say that both the new tables and the new dies are so incomparably superior to the old ones that it gives us much pleasure to recommend them.

Very truly yours,
SEDDON & EDWARDS BRICK CO.

NEWELL IMPROVED CLAY PULVERIZER

We Guarantee the Material and Workmanship and allow a Trial of our Machine to any Responsible Party.



NEW 19-INCH LETTER C PULVERIZER, WITH HOPPER REMOVED.

Heavy Cold Rolled Shafts running in best Anti-Friction Metal Bearings, protected from dirt.

A FEW OF OUR CUSTOMERS AND REFERENCES:

Henry Maurer & Son, (3 Pulverizers) 420 E. 23rd St., New York City.
Peerless Brick Co., Philadelphia, Penn.
Perth Amboy Terra Cotta Co., (2 Pulverizers) Perth Amboy, N. J.
Syracuse Pressed Brick Co., Syracuse, New York.
Potomac Terra Cotta Co., (2 Pulverizers) Washington, D. C.
Siner & Brother, Frankford, Penn.
W. H. Perot, Baltimore, Md.
The Rathbun Co., Deseronto, Ontario, Canada.
Murrill Dobbins, (3 Pulverizers) Philadelphia, Penn.
American Brick & Tile Company, Phillipsburg, New Jersey.

Send for Illustrated Circular and Price List.

NEWELL UNIVERSAL MILL CO., - 10 Bethune St., NEW YORK.

MANUFACTURERS OF

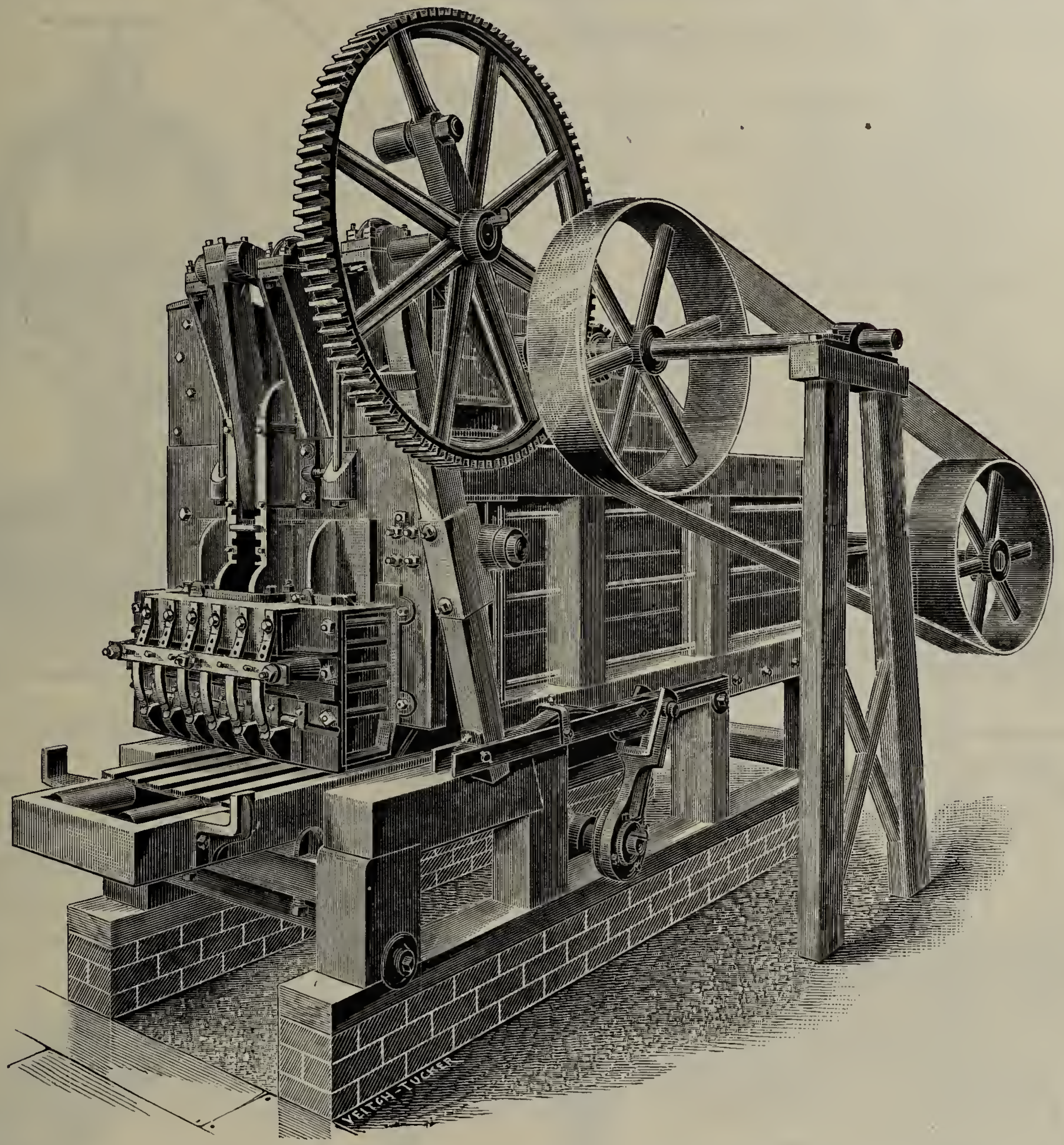
Clay Crushers, Stone Separators and Pug Mills.

Full line of Clay-working Machinery.

THE "NEW HAVEN"

HORIZONTAL STEAM POWER BRICK MACHINE.

WEIGHS 12,000 POUNDS.



SIMPLE, STRONG, DURABLE.

No Pug Mill Required.

HEAVIEST, MOST POWERFUL, and **BEST MACHINE** on the market for making sand moulded brick being carefully designed to secure the **Greatest Possible Production of First-Class Brick with the Least Outlay and Loss of Time to Repair Breakages.**

We have found Brickmakers (now using this machine) who think it wiser to buy a substantial Machine than waste time, exhaust patience and lose money with the many cheaply constructed machines with which the country is flooded; and we are positive there are many others who think the same way. If you are one of them write us and we will tell you all about it.

We believe our years of experience with Brick Machine repairs and the advice of a practical Brickmaker has enabled us to produce a Machine Superior to all.

The McLagon Foundry Co.,

NEW HAVEN, CONN.

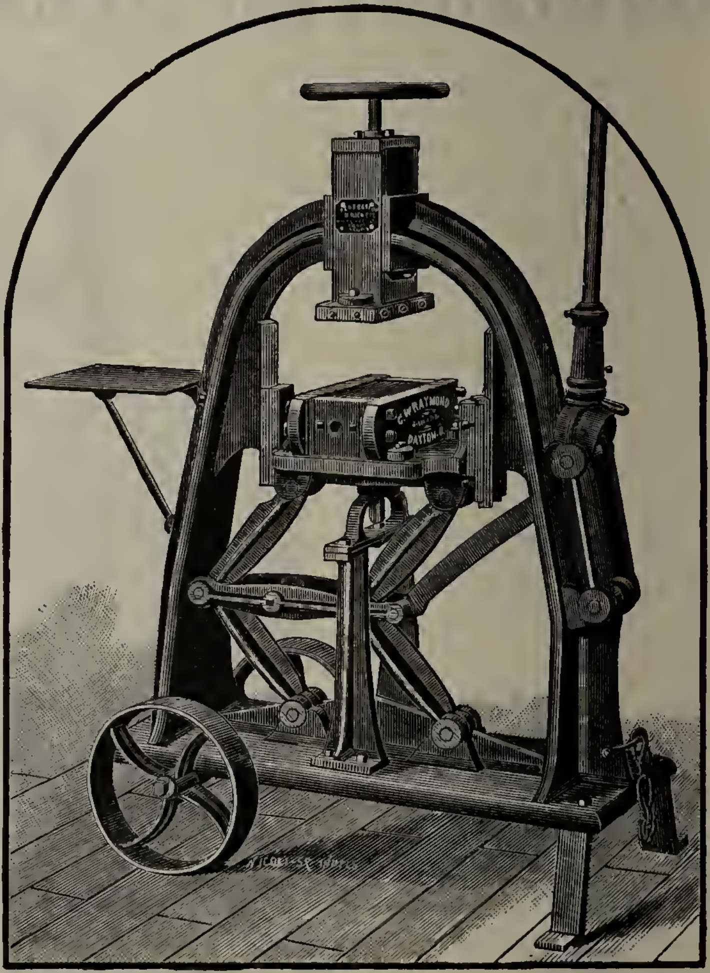
[Mention the Clay-Worker].

RAYMOND'S
PERFECTION BRICK PRESS.

(NO. 1 FOR RED BRICK. NO. 2 FOR FIRE BRICK.)

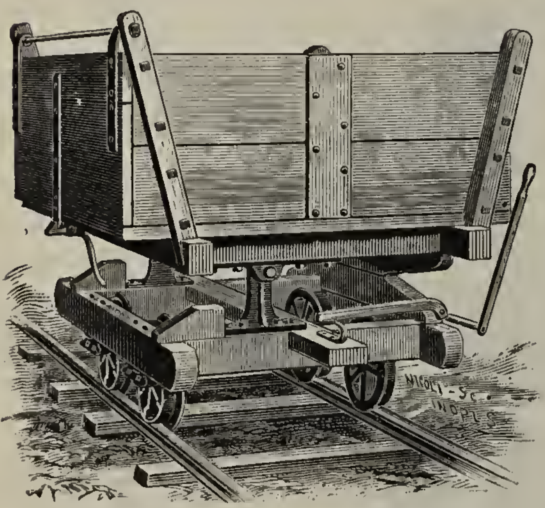
SIMPLE, POWERFUL.

Its whole action is derived from a short, easy, but powerful movement of one lever. A Perfect press which turns out perfect work.



—MANUFACTURERS OF—

AUTOMATIC DUMPING CARS,



For Brick Yards, Gravel Pits, Plantations, Mines, Etc.

SAVES TIME.

SAVES LABOR,

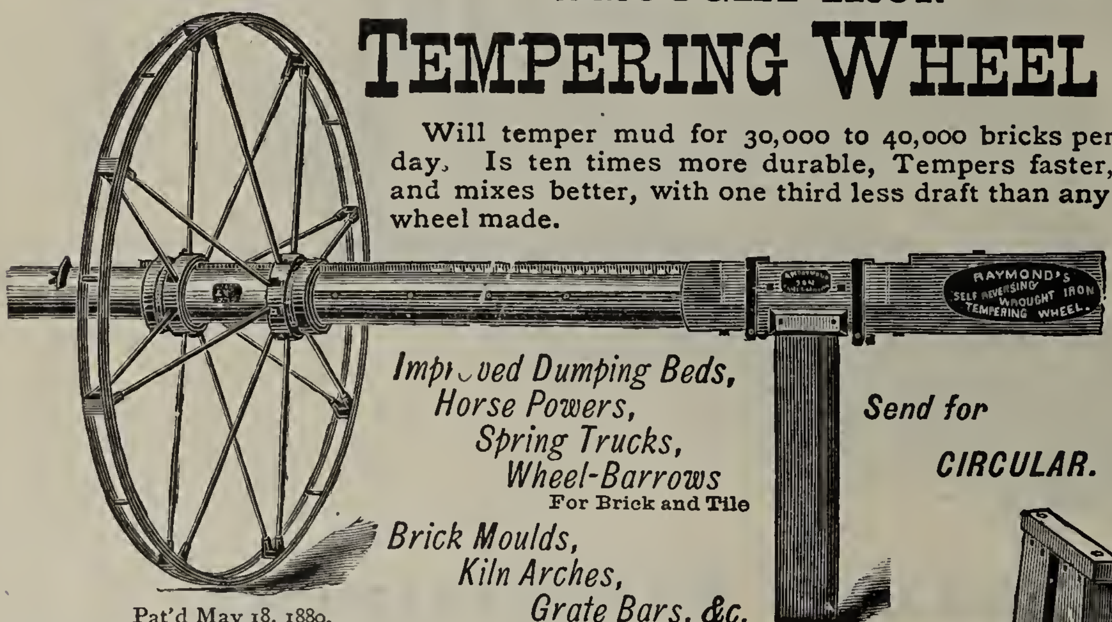
SAVES MONEY.

Write for Illustrated Catalogue giving full description.

RAYMOND'S

WROUGHT IRON

TEMPERING WHEEL


RAYMOND'S SELF REVERSING WROUGHT IRON TEMPERING WHEEL.

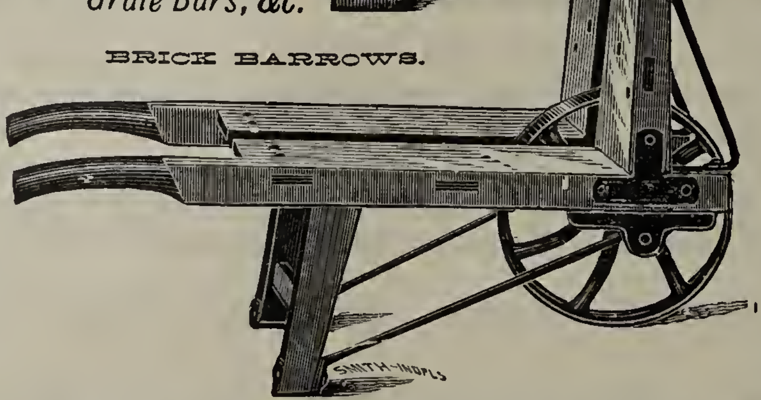
Will temper mud for 30,000 to 40,000 bricks per day. Is ten times more durable, Tempers faster, and mixes better, with one third less draft than any wheel made.

Improved Dumping Beds,
Horse Powers,
Spring Trucks,
Wheel-Barrows For Brick and Tile
Brick Moulds,
Kiln Arches,
Grate Bars, &c.

Send for
CIRCULAR.

Pat'd May 18, 1880.

BRICK BARROWS.



Our Barrows are made from the best of seasoned white-oak, braced in front and cross braces underneath; iron wheel and axle and three coats of paint; the frame is morticed throughout. They will stand the rough usage of the brick yard. For strength and durability they have no equal.

BRICK MACHINE MOLDS.

We manufacture a great number and variety of molds and with improved machinery, we are able to fill orders with dispatch. Our molds are made of the best of cherry wood with side pieces gained for partitions and each partition is in turn dove-tailed into the sides. **They are thoroughly iron bound.** The cross-irons being dove-tailed. Without doubt, the most substantial mold made.

C. W. RAYMOND & CO.,

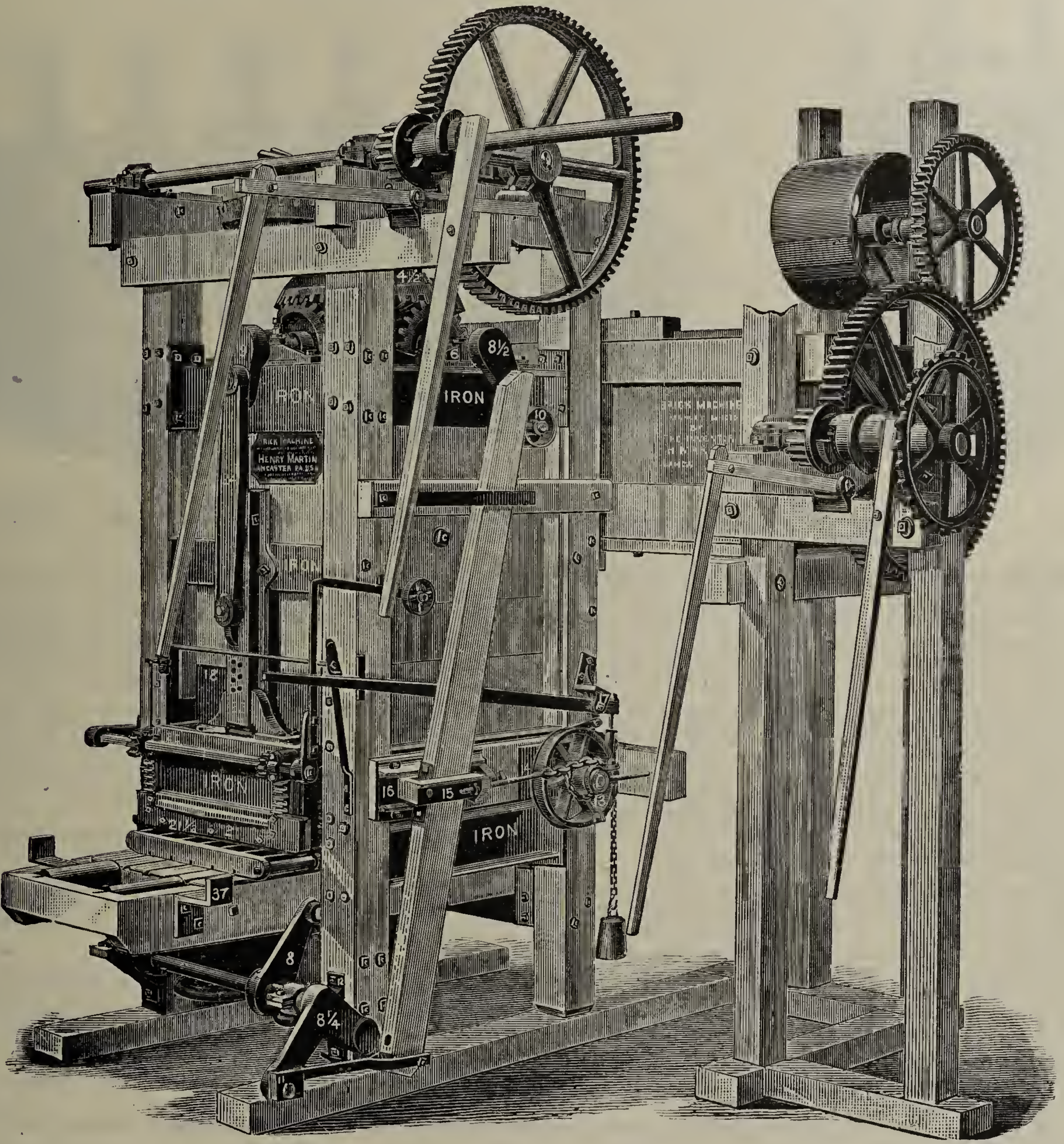
7 & 11 WAYNE STREET, (Mention Clay-Worker.) DAYTON, OHIO.

Laidlaw Manufacturing Co., Hamilton, Ont., Special Agents for our goods for Dominion of Canada.

The Henry Martin Brick Machine.

For Steam or Horse-Power.

WITH OR WITHOUT PUG MILL



WITH OR WITHOUT PUG MILL.

This cut represents our Steam-Power Machine and Pug Mill combined. It is the strongest. It is the best. It is the most simple. It is the most perfect. It does the best work. It works any clay. It does not get out of order. It is not liable to break down. It stands hard usage.

BETTER THAN EVER.

Our machines are this season the Best ever built by our Mr. Henry Martin, whose thirty years' experience has rendered him familiar with the wants of the Trade.

For Strength, Durability, Qantity of Output and Quality of Work, they have no equal.

Brickmakers make no mistake when they buy the Henry Martin Machine.

—MANUFACTURED BY—

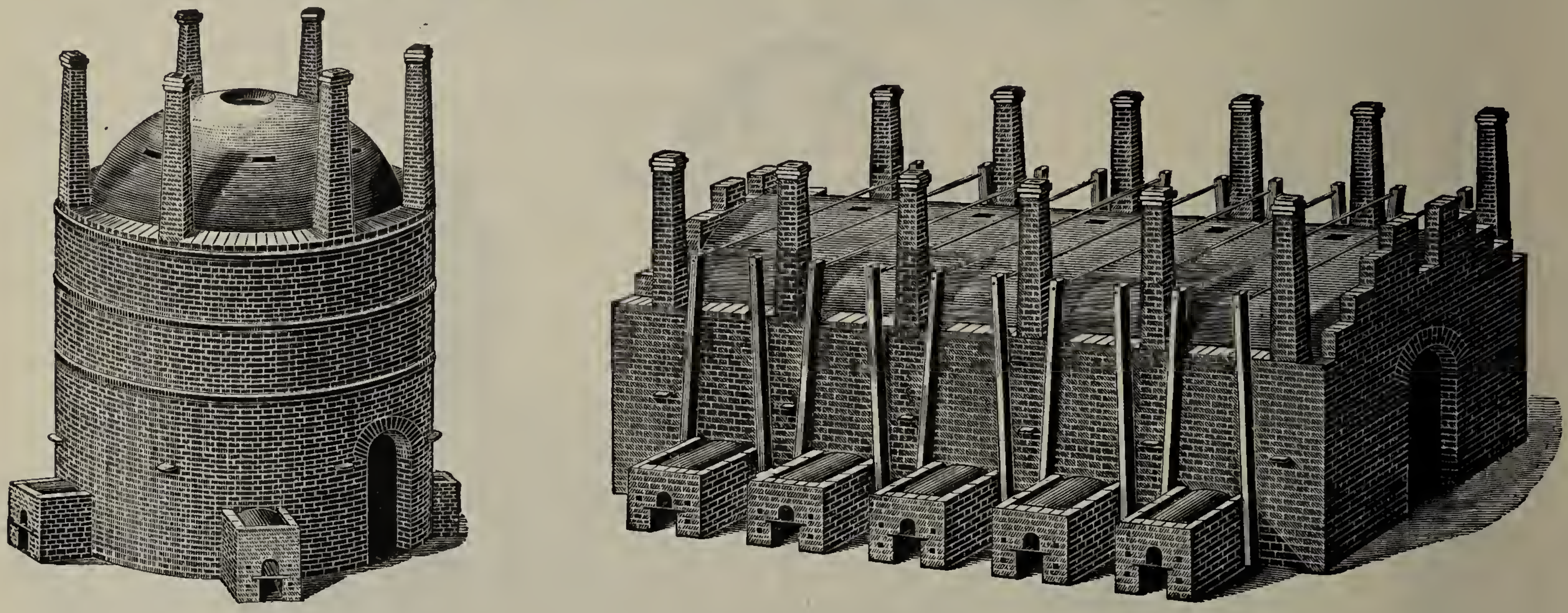
The Henry Martin Brick Machine Mfg. Co.,

Send for a Catalogue.

LANCASTER, PA., U. S. A

THE EUDALY KILN.

BURNS ANY KIND OF CLAY OR WARE.



THE DOWN-DRAFT KILN.

UNIFORMITY IN BURNING is without a doubt the most essential feature to clay workers. Especially is this the case with fine clays where it is desired to have the wares of uniform color, size and hardness.

In the construction of these kilns particular attention has been paid to this point, by having first carefully examined the subject of drafts and the strength and nature of the different kinds of fuel. The size of the kiln, the size and number of furnaces, flues and chimneys must always sustain the proper relation to each other for a perfect draft. Too much draft is as dangerous as too little. One of the greatest mistakes of kiln inventors and builders is that they utterly disregard the important subject of drafts.

ABILITY TO DIRECT THE HEAT TO ANY PART OF THE KILN is equally as important as a proper draft. Unless the burner has control of the heat in the kiln he has no assurance of a uniform burn. In these kilns if the burner finds the wares too hot in any portion of the kiln he can in a moment shift the heat to any other part where it is not so hot, or what is better, if he has two or more kinds of wares in the kiln, one of which requires more burning than another, he can easily give that portion of the kiln an extra amount of heat. We claim that this is the only kiln in which these results can be attained successfully.

For this reason wares can be burned by this system **more uniformly** than by any other.

Practically there is no difference from top to bottom, yet this is purely a *down draft* kiln. There are no inside dampers or cut-offs. **Everything about the kiln is permanently built.**

ECONOMY OF FUEL AND LABOR is perhaps the second most important feature of any kiln. We hear a great deal said about "economy in fuel and labor," but to understand what is necessary to a fuel and labor saving kiln one should be thoroughly acquainted with all kinds of fuel and the conditions necessary to get the greatest number of heat units out of it, and at the same time **distribute the heat to the burning wares in the most effective manner.**

We claim that our latest improved furnace is the most **complete economizer** of fuel that has ever been invented.

The construction is purely scientific, and is made by first obtaining the chemical requisites necessary to insure perfect combustion and then building a furnace to bring about these results. Different kinds of fuel require a different size and construction of furnace. We use any kind of fuel, soft coal, screenings, oil, gas or wood.

COST OF CONSTRUCTION.—These kilns require no large stack, which ordinarily costs as much as the kiln proper. Many persons think they must have a large, tall stack in order to have sufficient draft to get the bottom of the kiln burned.

This is certainly a mistaken notion.

The things that are required, however, are a correct location and size of furnaces, flues and chimneys with reference to each other and the kiln. When these are properly attained the burner need have no fear about draft.

In these kilns great care has been taken to adjust these relations in such a way that the expensive stack is not at all required, and a much better draft obtained.

DURABILITY.—Each part of these kilns is built with special reference to strength and durability.

The furnaces, which are perhaps the most perishable parts of any kiln, are in these kilns made very strong and durable.

Those parts most liable to burn out can be easily removed and replaced without damage to the other parts of the furnace.

Rules are given by which a builder of these kilns can get the strongest crown and best supports to the kiln.

SIZES.—These kilns can be built either **round** or **square**, and of **any** desired **size.** A number of these kilns are now in use that burn from **150** to **250** thousand bricks at a time. The walls are built **twenty-four inches thick.** They should be lined throughout with fire-brick where the clay is very hard to burn. Good kilns can be made, however, without using fire-brick for any part except the **furnaces** and **bags.** In asking for cost of construction **state size of kiln in feet wanted,** whether the kiln walls, crown or bottom are any or all to be lined with fire-brick.

DRAWINGS and specifications for building kilns will be furnished any who purchase *kiln or yard rights.* We usually can urnish a man to superintend the building if desired.

For further information address

W. A. EUDALY,

64 Johnston's Building, - - - - CINCINNATI, OHIO.

MORRISON'S IMPROVED KILN

FOR -:- BURNING -:- CLAY -:- WARES

Especially adapted to Burning Common, Repressed and Ornamental Brick.

PATENTED IN UNITED STATES AND CANADA.

SUCCESSFUL! DURABLE!

Daily product of our Kilns in the United States, One-Half Million Bricks. Our claims fully substantiated BY OUR PATRONS. We claim ninety to ninety-five per cent. hard brick. Arch bricks all Fronts and Pavers and none damaged—of uniform color. Pressed brick burned without fire-marks—coal screenings preferred for fuel. One fireman for two hundred thousand bricks. The

Only Kiln That Regulates the Temperature of Heat

And directs its course by a system of air drafts, giving complete control of the degree of heat, as well as its manipulation. This system we have covered by letters patent. Any persons using these air drafts are liable to prosecution for infringement.

Read the following testimonial from a recent patron, and another new one from an old patron:

R. B. Morrison, & Co., Rome, Ga.: Knoxville, Tenn., October 31st, 1888.

GENTLEMEN—I have used your *Improved Kilns* during the past twelve months and cheerfully report the result. We burn our bricks in your Kiln at a cost of sixty-five cents per thousand for fuel and labor; a saving to us, over our old method, of eighty cents per thousand on he two items. My saving in waste brick in the kiln and at the building is fully *ten per cent.*, or sixty cents per thousand in other words. Every time I burn your kiln of 300,000 bricks it is a saving to me of *more than four hundred dollars* over the old process. I find your kiln durable and simple to operate. We use coal screenings for fuel. Have no waste in arches, and burn ninety per cent. hard brick. I have no hesitation in pronouncing your kiln a success in every respect, as you make no claims it does not fulfill. Yours Truly,

REPS. JONES.

R. B. Morrison & Co., Rome, Ga.: Atlanta, Ga., July 20th, 1888.

GENTLEMEN—We have used your Improved Kilns for three years and during that time have burned upward of a hundred millions in them and wish to emphasize our former statement in regard to your kilns. They are reliable, durable, and the best kilns for our purpose, we have been able to find after investigating many of the various kilns in use, and say to our friends of the trade: If you want kilns that will burn your brick nearly all hard. and do it every time, burn them economically and without loss, and with little cost for repairs, secure the Morrison Kiln.

CHATTAHOOCHEE BRICK CO., per GEO. W. PARROT, Vice-Pres.

—WE SELL OUR KILN STRICTLY ON MERIT—

☞For descriptive circulars, additional testimonials, and all information desired, address

R. B. MORRISON & CO.,

Box 335, - - - - ROME, GEORGIA.

GENTLE READER: In the October number of the CLAY-WORKER we propose to explain why the "Grand Automatic" Brick Machines have become the favorites with all the leading brick manufacturers both at home and abroad.

We may also have a few words to say in regard to Clay Disintegrators.

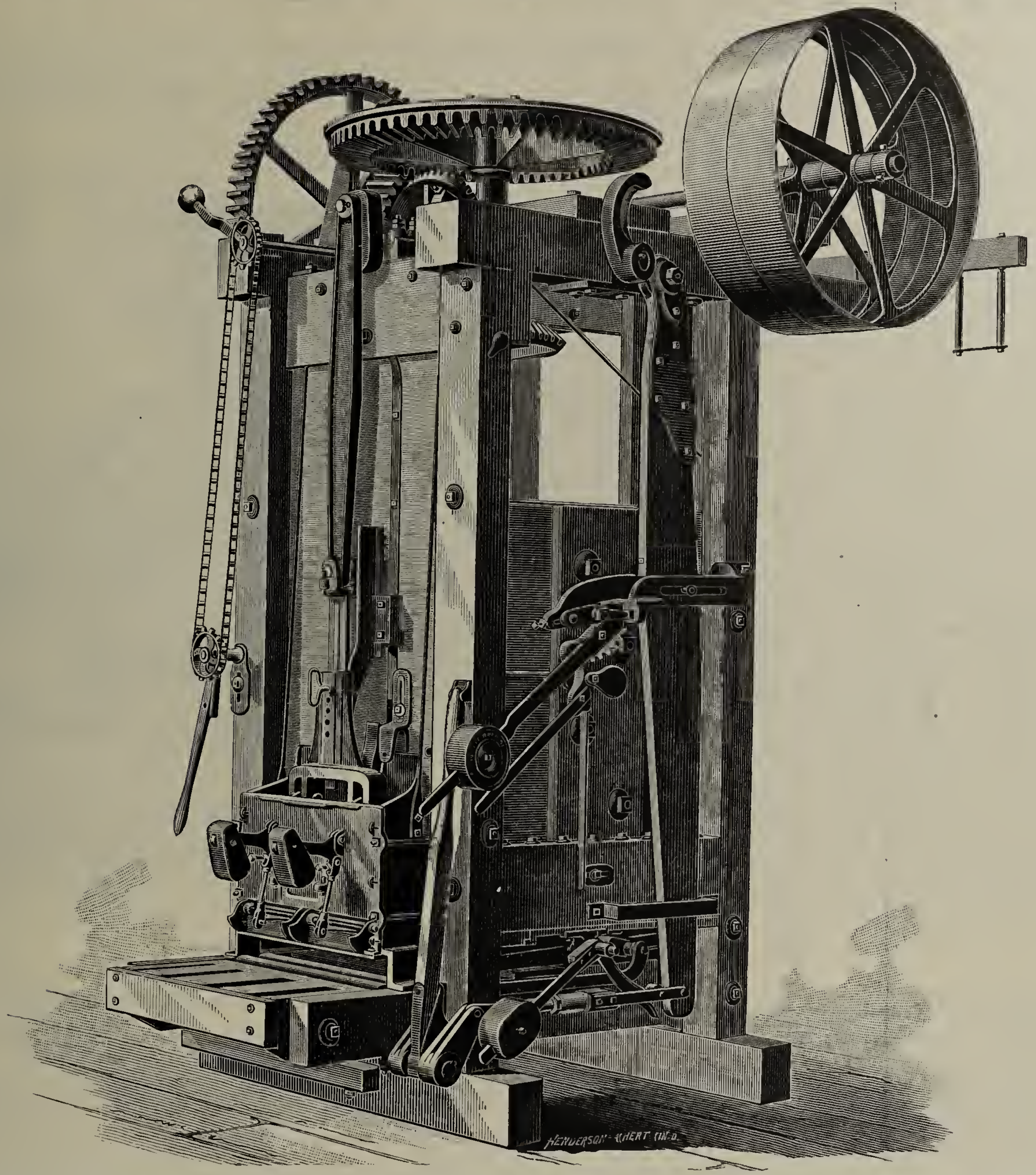
☞ Correspondence solicited.

JONATHAN CREAGER'S SONS,

CINCINNATI, OHIO.

[Mention the Clay-Worker.]

The "Tiffin" AUTOMATIC Brick Machine


HENDERSON-ACHERT LITH. CO.

The "Tiffin" **Automatic** Brick Machine is, **beyond question**, the best machine of its class in the market. It is **Heavy, Strong** and **Durable. IT IS GUARANTEED TO DO GOOD WORK.**

The **"TIFFIN"** is made for use by **Steam**, or **Horse** power. The capacity of the **Horse Power Machine** is 18,000 to 20,000 per day, and of the **Steam Power** 25,000 to 40,000 per day, according to the speed at which they are operated.

Both styles are equipped with our **Automatic "Stone Doors,"** which permits a stone, or any other hard substance, that may have passed in with the clay, to pass out **without breakage to the Machine.**

PRICES:		
	Steam Power Machine	$350.00
	Horse Power Machine	$250.00

The principal shafts are of Steel, and all other material used, is **First Class. Competent Workmen Only Employed** in their onstruction. These machines have been **Thoroughly Tested** in the hands of **Experienced Brickmakers** during the past season, and with the most **Satisfactory** results to them. Parties who may be **Interested Enough** to wish to make inquiry, will be given the names and address of the parties who have had them in use.

We are the makers of the **CELEBRATED "OLD RELIABLE"** Brick Machine, for use by hand power, which is so well and favorably known to the Brickmakers of the entire country. We are also manufacturers of Turn Tables, Trucks, Wheel Barrows Molds, Kiln Doors, Etc., Etc. Correspondence solicited.

TIFFIN AGRICULTURAL WORKS,

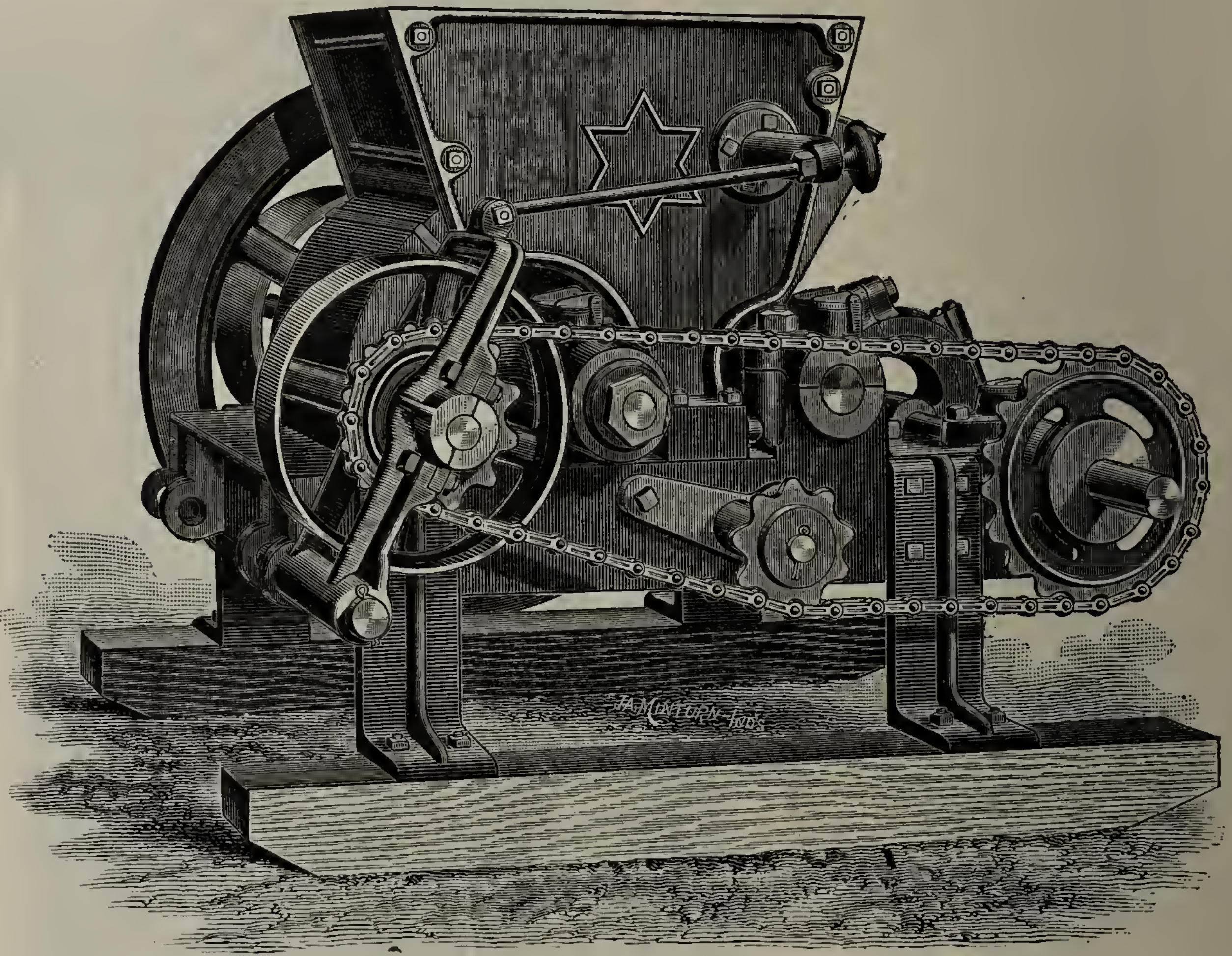
[Mention the Clay-Worker.]

TIFFIN, OHIO.

THE POTTS DISINTEGRATOR

—IS THE—

Only machine made that will pulverize wet or dry clay, putting it in the best possible condition for making brick or tile.



It pulverizes all stones so fine that they will not show in brick after being burned

It is indispensable where hard, tough clays are being worked.

Clays which will not soak or take water and are considered hard to work, are worked with ease and the brick made are superior to those made by pit soaking the clay.

These machines not only grind the clay, but thoroughly mix the same.

All machines are guaranteed to give satisfaction and are shipped subject to trial.

A WARNING.

Jonathan Creager's Sons, of Cincinnati, Ohio, are now manufacturing a Clay Disintegrator which is an infringement on our Patents: We have brought suit against them in the United States Circuit Court for the Southern District of Ohio.

We presume that this will be accepted as a sufficient answer to their statements in May number of Clay-Worker that our former notice was meant for bluff only.

We intend fully to protect our rights, and only waited until it was apparent that they were being wilfully infringed to bring suit.

Our Patents are numbers 322,393, *dated July* 14*th,* 1885, 368,898 *dated August* 28*th,* 1887, *and* 384,278 *dated June* 12*th,* 1888.

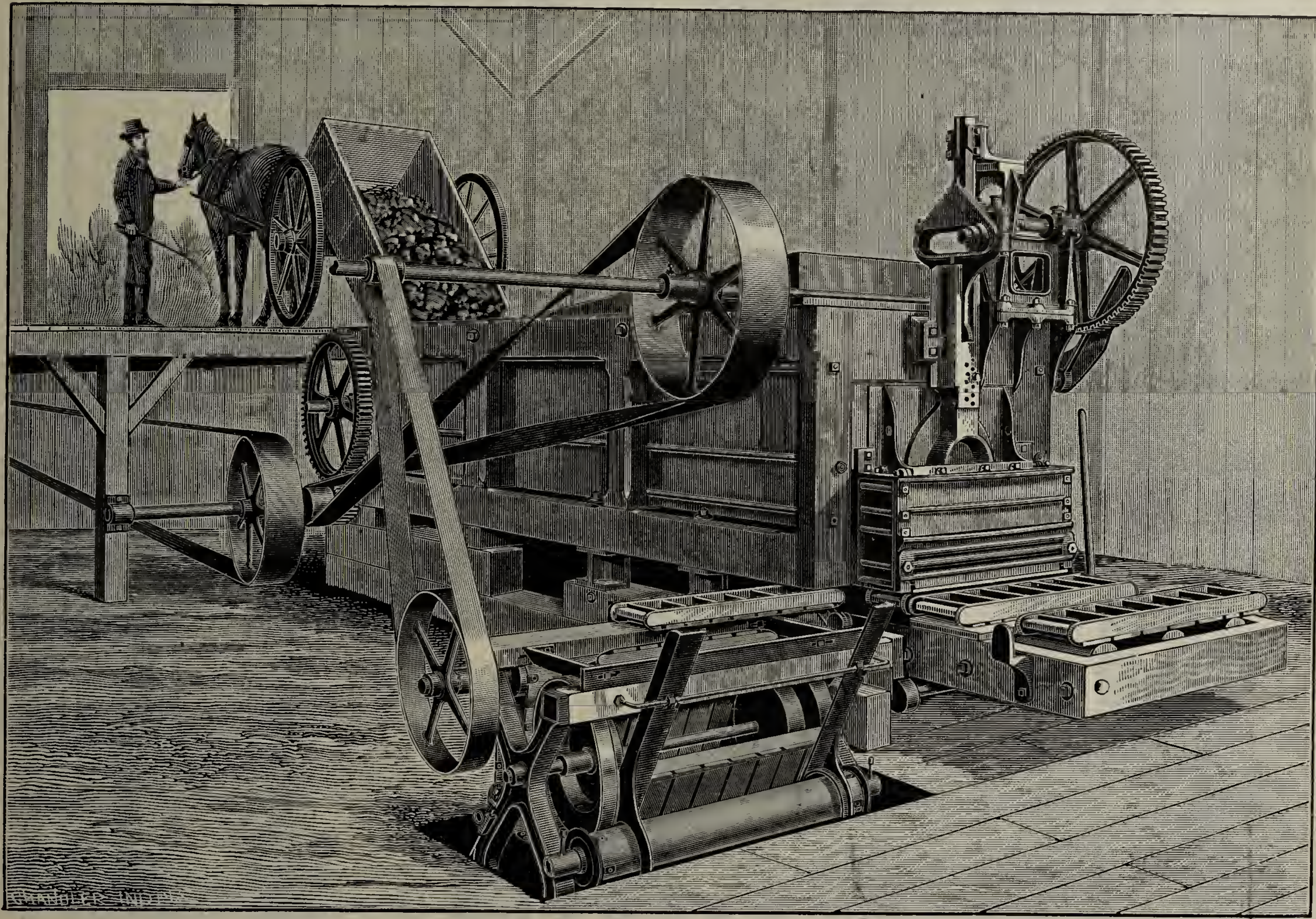
◆

Our Brick Machines, Pug Mills, Disintegrators and Mould Sanders have no equal. Write for prices and terms.

C. & A. POTTS & CO.,

INDIANAPOLIS, - - INDIANA.

THE POTTS HORIZONTAL STOCK BRICK MACHINE.



Requires no extra Pug Mill to work the clay direct from the bank.
It has the largest tempering capacity of any machine on the market.
All brick made have clean, smooth surfaces and sharp corners.
It works the clay stiff enough to make the finest Stock Brick.

Our Mould Sander shown in cut has taken the lead of all machines for this purpose. There is no place for the moulds to catch and cause delays. It will not spill or waste any sand. It is easily and quickly adjusted to any size mould.

☛ **NOTICE**:—A. H. Newton, of Cohoes, N. Y., claim our machine is an infringement on patent owned by them, and that persons using our machine will be prosecuted. As to this we would say that we do not infringe said patents; that we have put our machines on the market only after a careful investigation, to ascertain exactly what our rights are in the premises, and, being fully satisfied of our rights, we are prepared to protect our customers and Patents No. 397,274 of Feb. 5, 1889.

We are prepared to erect complete plants of any capacity and keep in stock full line of **Brick Machines, Pug Mills, Disintegrators, Mould Sanders** and all brickyard supplies.

Do not fail to write for prices and catalogue.

C. & A. POTTS & CO.,

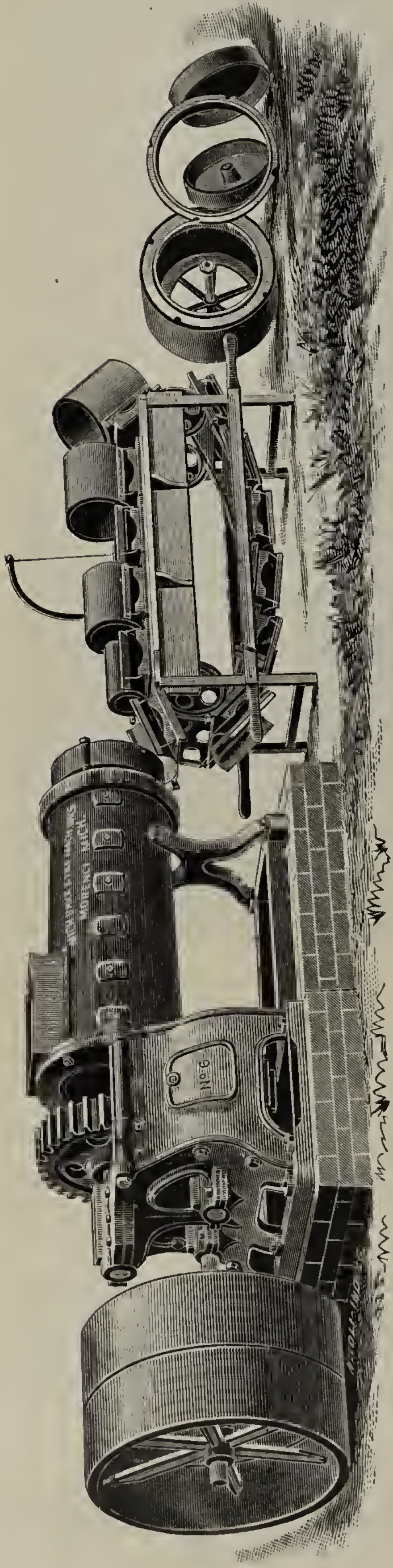
[Mention the Clay-Worker.]

INDIANAPOLIS, INDIANA.

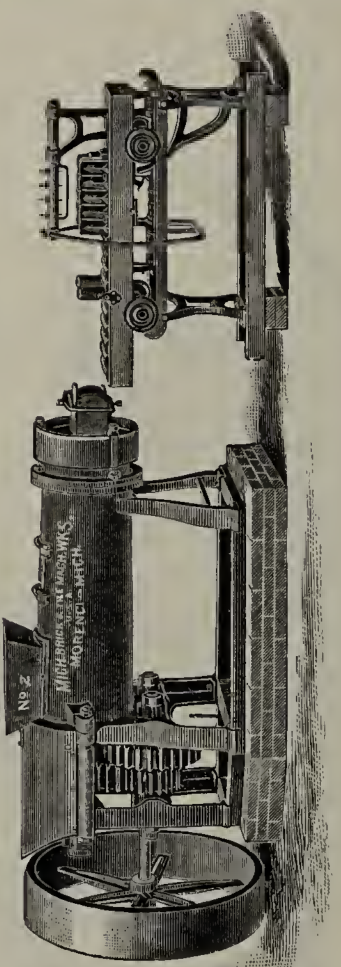
Michigan Brick & Tile Machine Works,

—MANUFACTURERS OF—

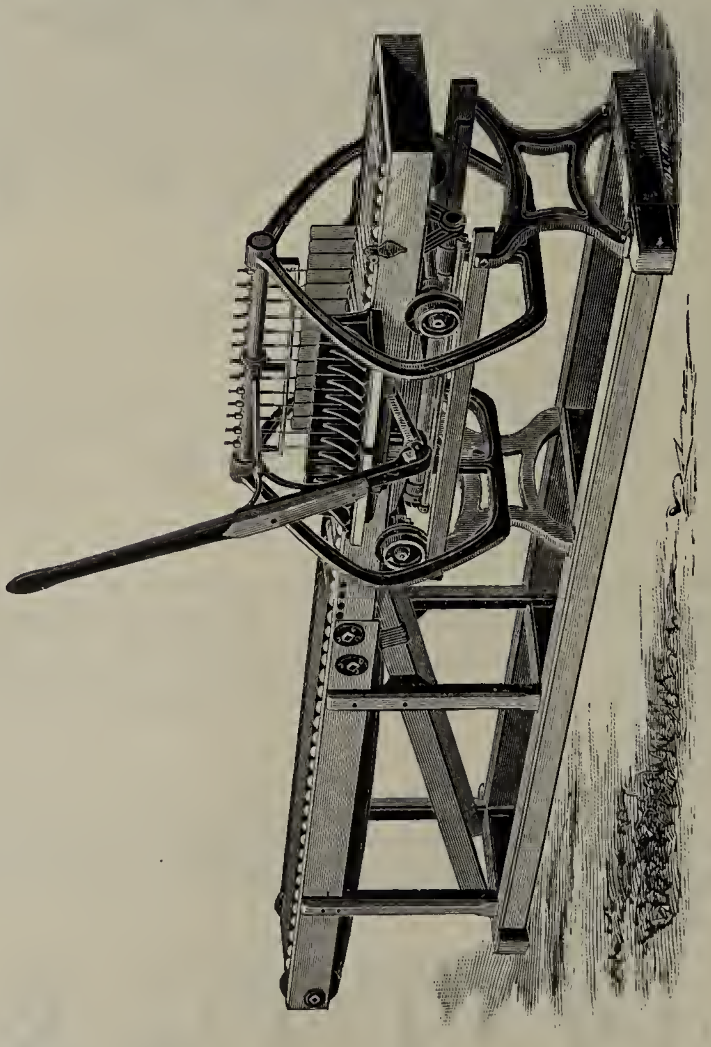
BRICK AND TILE MACHINERY.


MICH. BRICK & TILE MACH. WKS.
MORENCI, MICH.
No 6

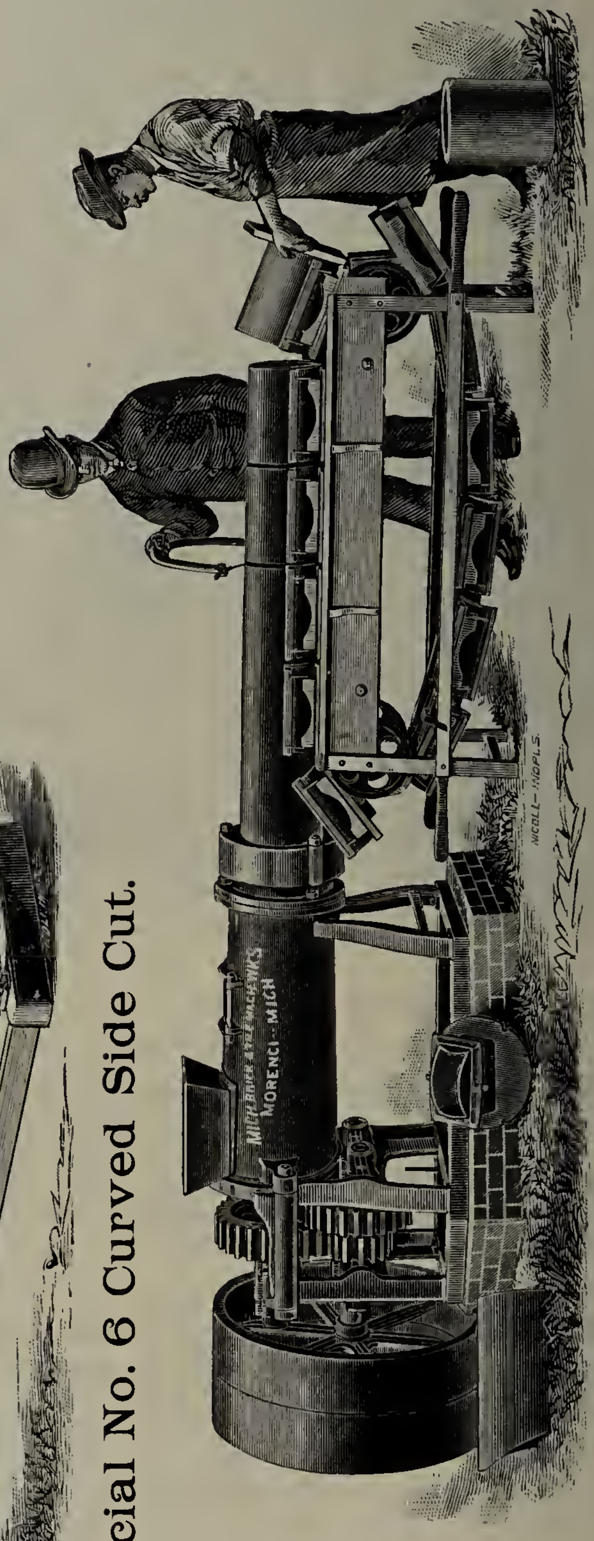
No. 6 Special Brick and Tile Machine.


MICH. BRICK & TILE MACH. WKS.
MORENCI, MICH.
No 2

No. 2 Brick and Tile Machine.



Special No. 6 Curved Side Cut.


MICH. BRICK & TILE MACH. WKS.
MORENCI, MICH.

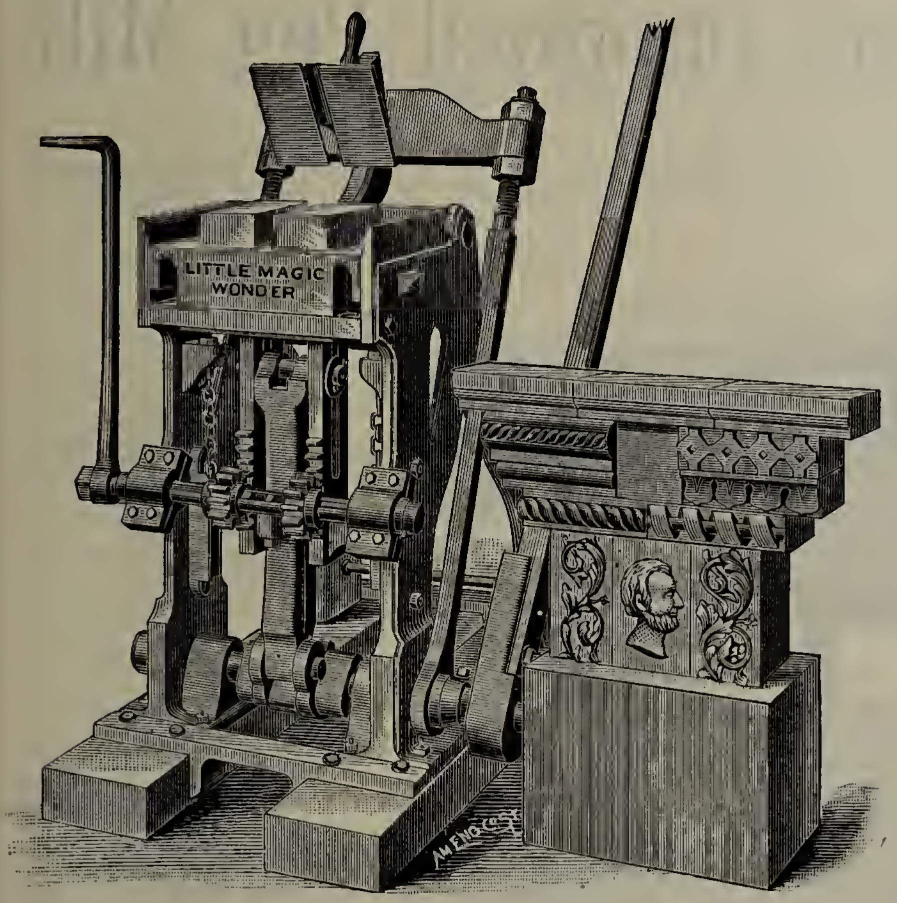
No. 1 Brick and Tile Machine.

☛ Send for Descriptive Circular.

MICHIGAN BRICK AND TILE MACHINE WORKS,

Lenawee County. [Mention the Clay-Worker]. MORENCI, MICH., U. S. A

The LITTLE MAGIC WONDER



It Will Do It!

Over 1,000 Different Patterns of Ornamental Bricks Can Be Made on this Wonderful Press.

Hear What a Prominent Brickmaker Says:

St. Louis, Feb. 3d, 1889.

Mr. Wm. Thaison, Austin, Texas:

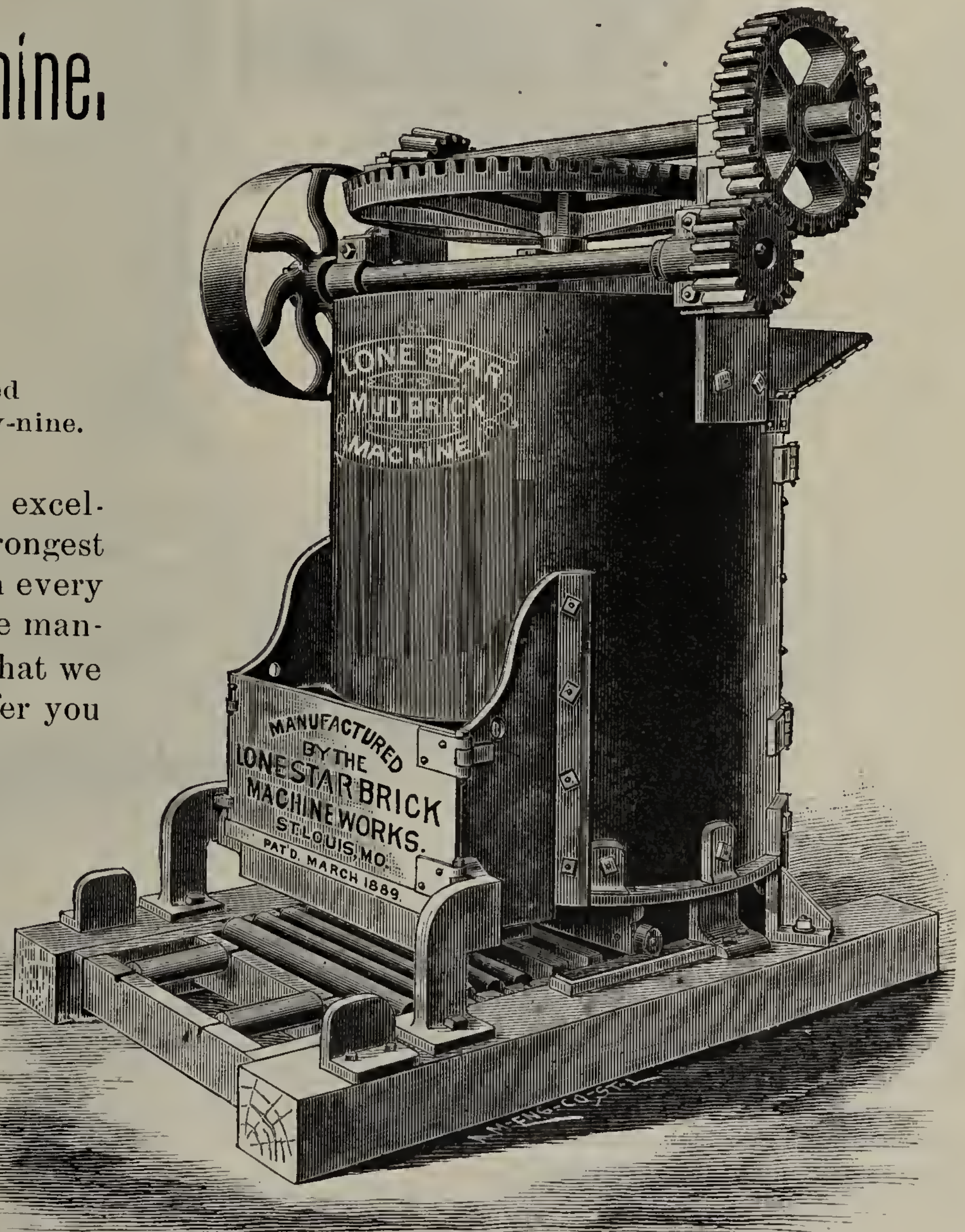
Dear Sir—At the end of a fair and satisfactory trial of your Little Magic Wonder Dry Clay Hand Brick Press, it affords me great pleasure to testify to its efficiency for the purpose intended. I had long been looking for just such a Press, whereon at short notice and at very slight expense we could, within a few hours' time get out small orders for ornamental bricks of special designs and patterns without interfering with the operation and working of our regular machines. The great value of your Hand Press to me, lies in the fact that we can make bricks upon it by pressure on edge as well as flat wise, thus enabling one to make almost any conceivable design of fancy moulded ornamental bricks. As you let your machines go out on trial there can come no loss to parties intending to purchase.

Very Respectfully, Anthony Ittner.

Mr. Ittner runs two of these machines. His reputation as a gentleman and an expert brickmaker is so well and favorably known to the readers of the Clay-Worker that further comment is unnecessary.

The Lone Star Soft Mud Machine.

Here is something new,
That's intended for you,
It's rather a trick,
For the making of brick,
Both handsome and fine
The best of its kind
Has just been invented
In March eighty-nine.


LONE STAR MUD BRICK MACHINE
MANUFACTURED BY THE LONE STAR BRICK MACHINE WORKS. ST. LOUIS, MO.
PAT'D. MARCH 1889.
A.M. ENG. CO. ST. L.

We call your undivided attention to this most excellent Soft Mud Brick Machine. It is of the strongest character and superior to the best in the market in every particular. As we have made arrangements for the manufacturing and putting up of 100 of these machines that we expect to sell this season, we are in position to offer you the most liberal bargains. *Send your order at once and don't delay.*

Capacity:

Steam Power Machine,	30–40,000,	Price $350.00
Horse-Power "	15–20,000,	" 250.00

Our Terms:

One-third cash must in all cases accompany the order to receive recognition or prompt attention.

☞For further particulars and circulars address

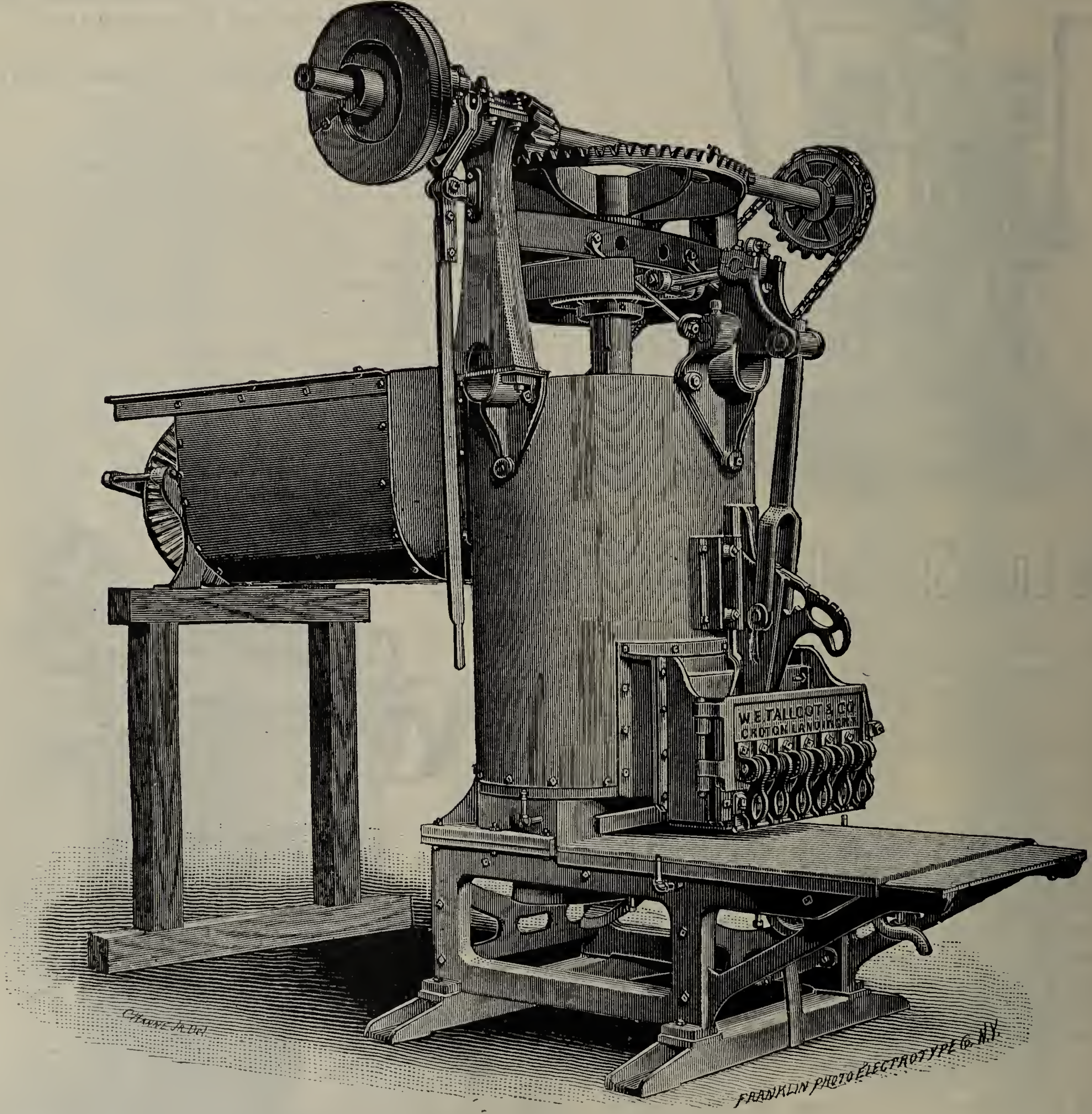
Lone Star Brick Machine Mfg. Co.,

AUSTIN, TEXAS.

Mention the Clay-Worker.]

W. E. TALLCOT & CO'S.

I. X. L. Brick Machine and Improved Pug Mill.


W. E. TALLCOT & CO.
CROTON LANDING N.Y.
C.HAWE JR DEL
FRANKLIN PHOTO ELECTROTYPE Co. N.Y.

This is a simple and powerful machine, making a superior brick and possessing advantages over all others. It is the result of years of experience in using and manufacturing brick machines. Among its advantages are *Great Strength, Simplicity and Durability* few parts, well protected from sand, yet easy of access for adjustment, renewal and repair. No wood is used in its construction; it i made all of iron and steel. Perfect automatic action to prevent breakage by stones or other obstructions. Great tempering capacit and ability to mould very stiff clay. It is easily understood, easily operated, easily kept in order. Quality of brick made, unsurpassed

The I. X. L. is eipecially designed and built for heavy work. Weight of Machine and Pug Mill 10,000 pounds. Weight of Machine without Pug Mill, 7500 pounds. Send for circular and prices.

It will pay you to use the I. X. L.

W. E. TALLCOT & CO.,
Croton Landing, New York

CHAMBERS BROTHERS CO.,

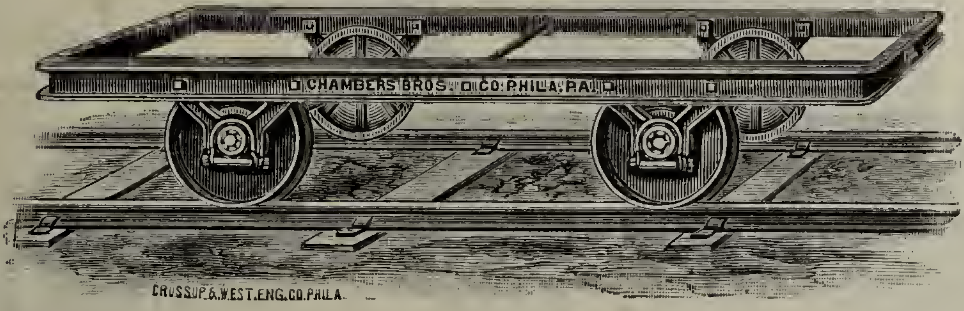
FIFTY-SECOND ST., BELOW LANCASTER AVE,

PHILADELPHIA, PA.

Improved Tunnel Dryers For Common Brick

And the Most Durable and Complete System for Transporting Green Brick.

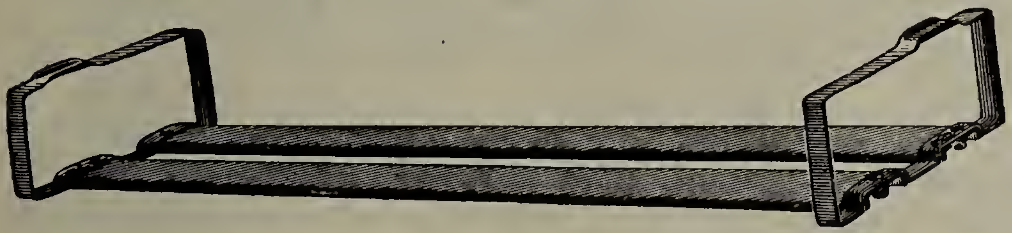
The Strongest Car Made.


CHAMBERS BROS. & CO. PHILA. PA.
CRESSON & WEST ENG. CO. PHILA.

The Strongest Car Made.

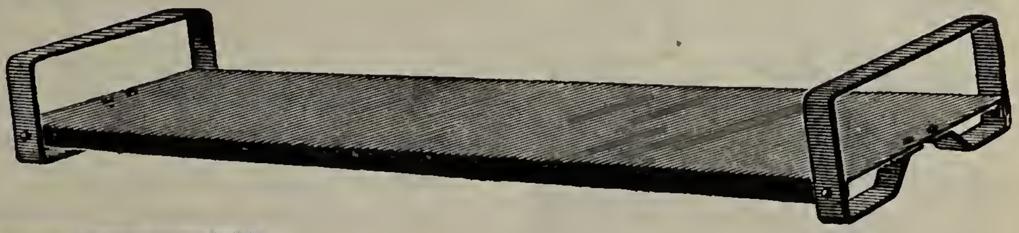
CHAMBERS' WROUGHT-BODY DRYER CAR.

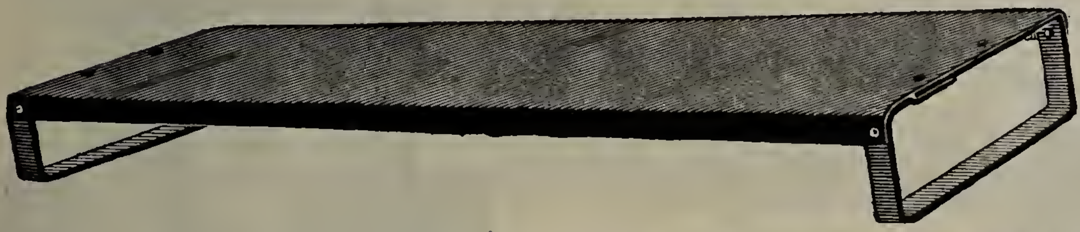
A lower priced Car with cast iron bodies made to order.



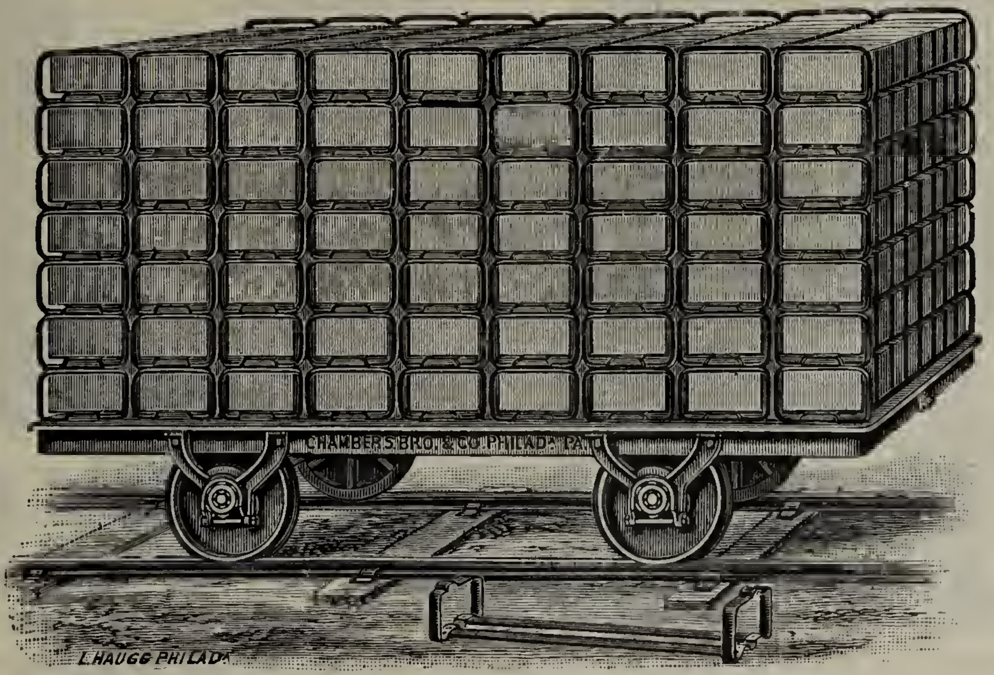
Wrought Iron Interlocking Pallet for Stiff Tempered Brick only.

Steel Pallet for brick placed on flat side or on edge.





Steel Pallet for soft moulded brick, or those placed on flat side only.


CHAMBERS BROS. & CO. PHILADA. PA.
L. HAUGG PHILADA.

CHAMBERS BROTHERS COMPANY,

PHILADELPHIA, - - PA.

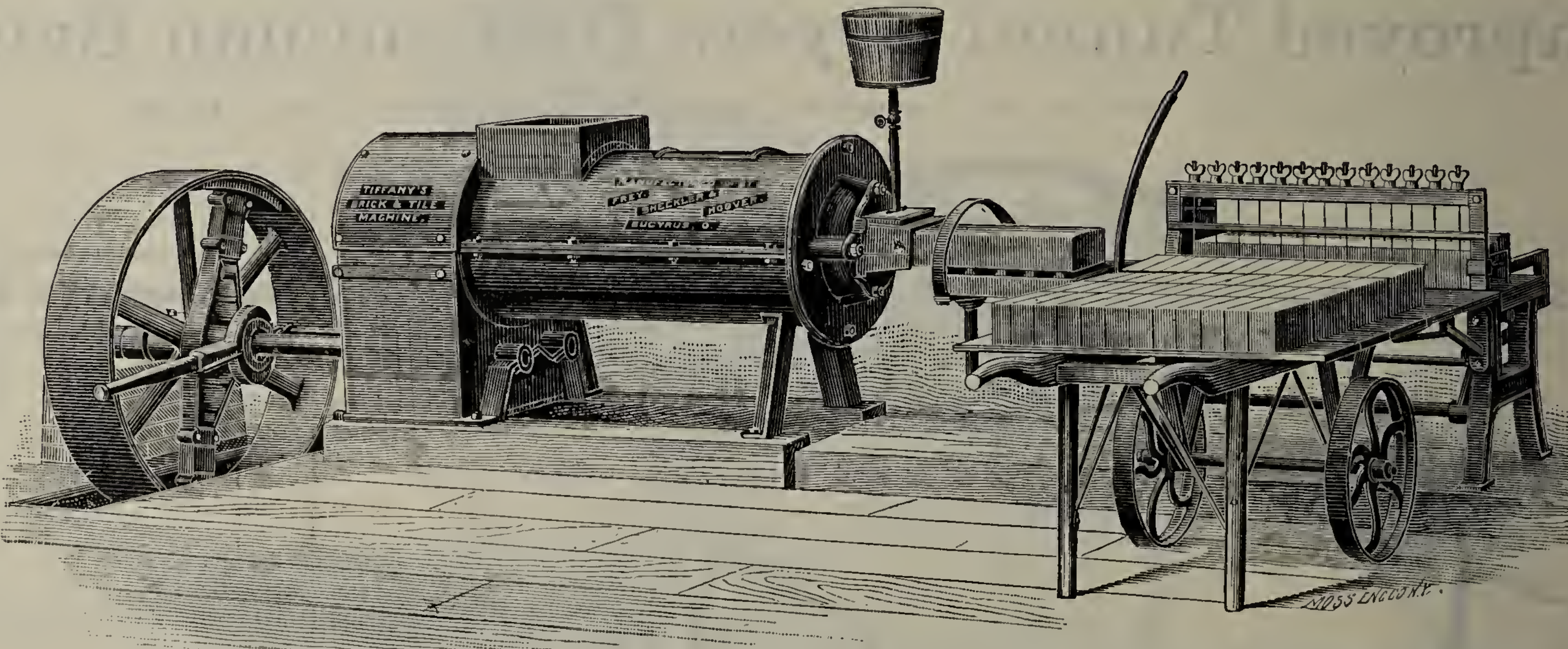
☞ See ad. on front cover page.

[Mention the Clay-Worker.]

THE FREY, SHECKLER CO.

BUCYRUS, OHIO

With increased facilities threefold.

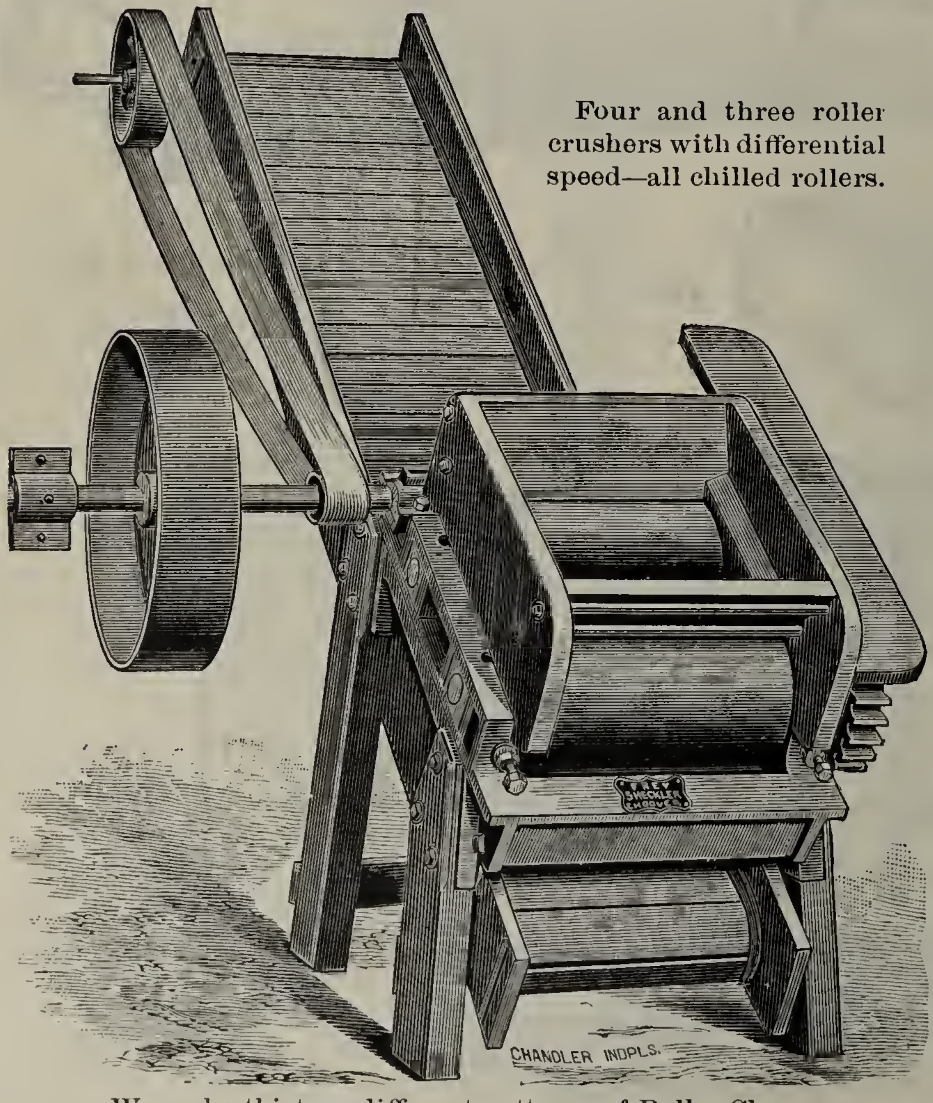

TIFFANY'S BRICK & TILE MACHINE.
FREY, SHECKLER & HOOVER BUCYRUS, O.
MOSS ENG CO N.Y.

Seven different brick machines. Four different tile machines. Will make any quantity of brick or tile as desired.

The Mascot for light power and low in price.

CUT OF CENTENNIAL WITH SELF-LOADING ATTACHMENT ON CUTTING TABLE.

The above cut shows the Board Delivery Cutting Table which loads the brick automatically on special trucks in connection with the Centennial Tiffany Machine and Patent Lubricating Brick Die. Acme Special Brick Machine, largest capacity. The Duplex, 80,000 brick per day.

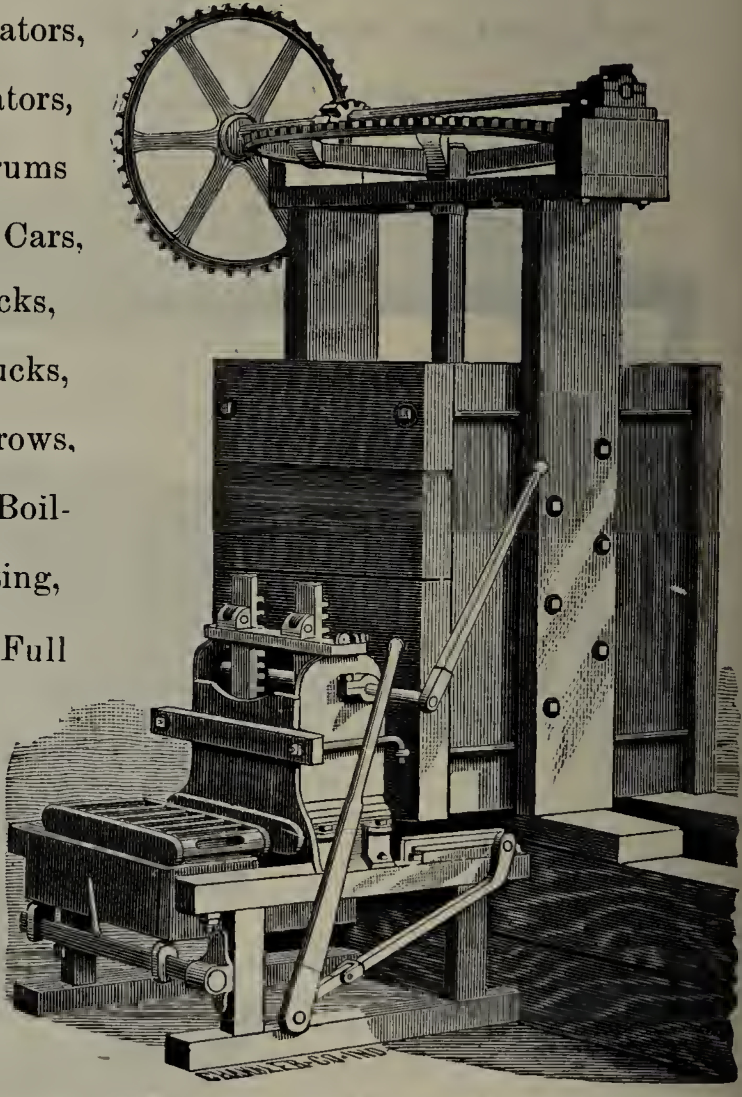


Four and three roller crushers with differential speed—all chilled rollers.

We make thirteen different patterns of Roller Clay Crushers. All rollers best chilled iron.

PLANS FOR KILNS FURNISHED CUSTOMERS.

Clay Elevators, Tile Elevators, Steam Drums and Dump Cars, Tile Trucks, Brick Trucks, Wheelbarrows, Engines, Boilers, Shafting, Pulleys. Full outfits for Brick and Tile Factories and Fire Clay Works.



The Eagle Brick Machine.

Cheapest and Simplest for Horse and Steam power (16,000 brick per day.)

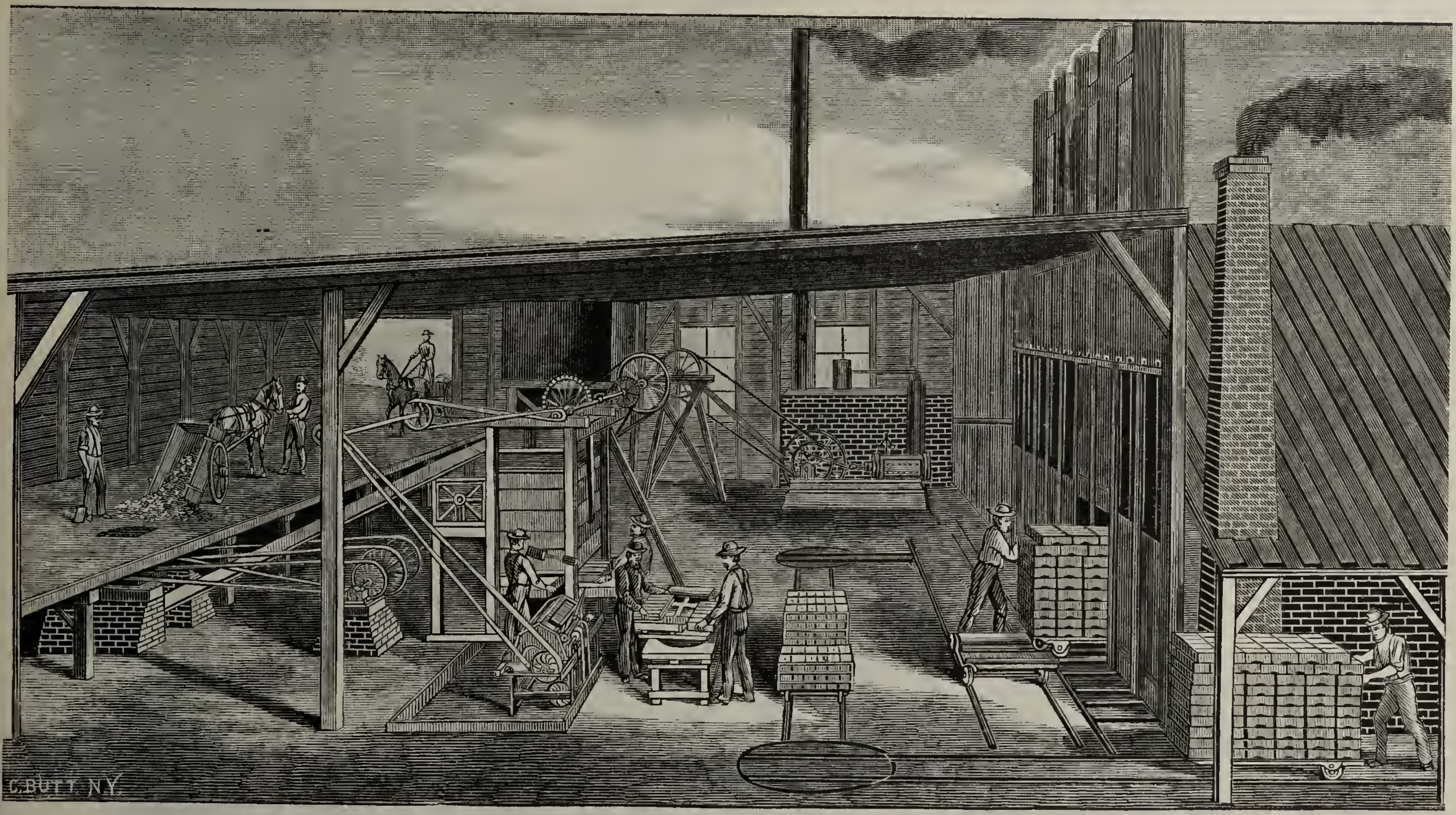
Send for illustrated circulars to

The FREY, SHECKLER CO., Bucyrus, Ohio.

SHARER'S IMPROVED DRYER

☞ More than one hundred now in use **DRYING SUCCESSFULLY** Soft Mud Brick, Stiff Mud Brick, Pressed Brick, Fire Brick, Hollow Brick, Tile, Plaster, Architectural Terra Cotta, Terra Cotta Lumber, Peat and Lumber. ☜

No other Dryer in existence can successfully dry such a variety of Materials.



27 have been built the present season and are now in successful operation.

The Only Successful Soft Mud Brick Dryer in Existence.

Will also dry Stiff Mud, Semi-Dry and Pressed Bricks at 50 per cent. less cost than any Steam Drier.

No other Dryer will Guarantee to dry Soft Mud Brick. I Guarantee to dry any kind of Bricks.

It is not a Direct Heat Dryer, nor a Steam Heat Dryer. It is a Radiated Heat Dryer. The heat being produced from Coal, Wood, Coke, Oil, Gas or any kind of Fuel, and Radiated through Brick or Metal floor. The heat can be so graduated as to successfully dry the most Tender or Refractory Clays without damage. While in a Direct Heat Drier the product of combustion coming directly in contact with the material to be dried will warp, check and crack in most cases. In a Steam Drier the heat cannot be graduated. Neither can heat be produced from Steam near as cheaply as from the Fuel Direct. With a Steam Dryer it is necessary to run one or more Boilers and Exhaust Fans day and night. There is No Machinery whatever necessary to operate my Dryer. Hence the wear and tear and expense of operating is reduced to the minimum.

References and all information given by letter or otherwise. Address,

GEO. W. SHARER, Proprietor,

8 South Broad Street, Room No. 1,

PHILADELPHIA, PA.

ED. H. CALLAWAY, Gen'l Agent, 72 Reade St., New York.
E. A. KING, Special Agent, New England States, 48 Congress St., Boston, Mass.
HUGH CAMERON, Toronto, Ont., Special Agt. Dominion of Canada.

Improved Eureka Dry Press Brick Machine.

WEIGHT SEVENTEEN TONS.

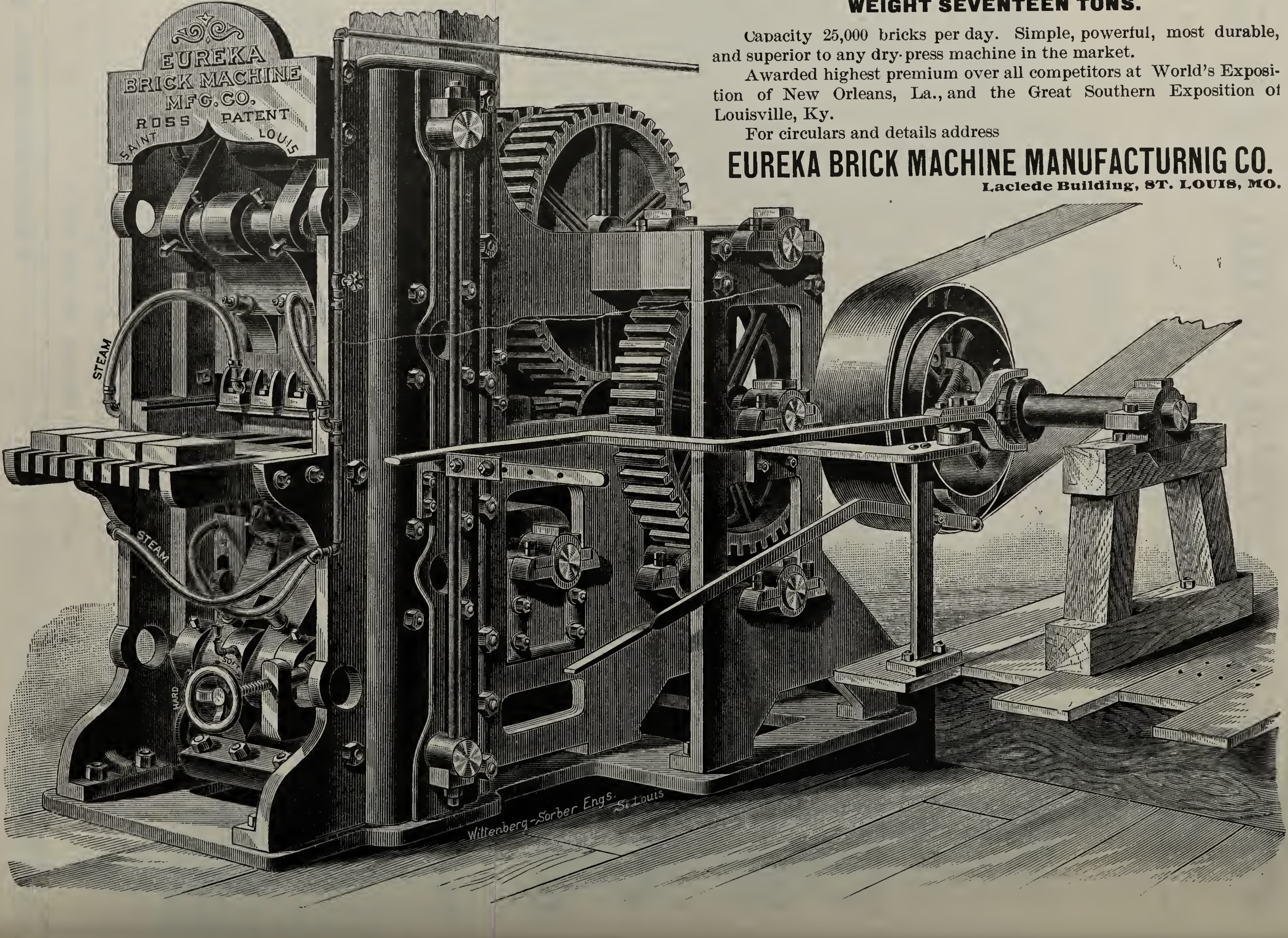
Capacity 25,000 bricks per day. Simple, powerful, most durable, and superior to any dry-press machine in the market.

Awarded highest premium over all competitors at World's Exposition of New Orleans, La., and the Great Southern Exposition of Louisville, Ky.

For circulars and details address

EUREKA BRICK MACHINE MANUFACTURNIG CO.

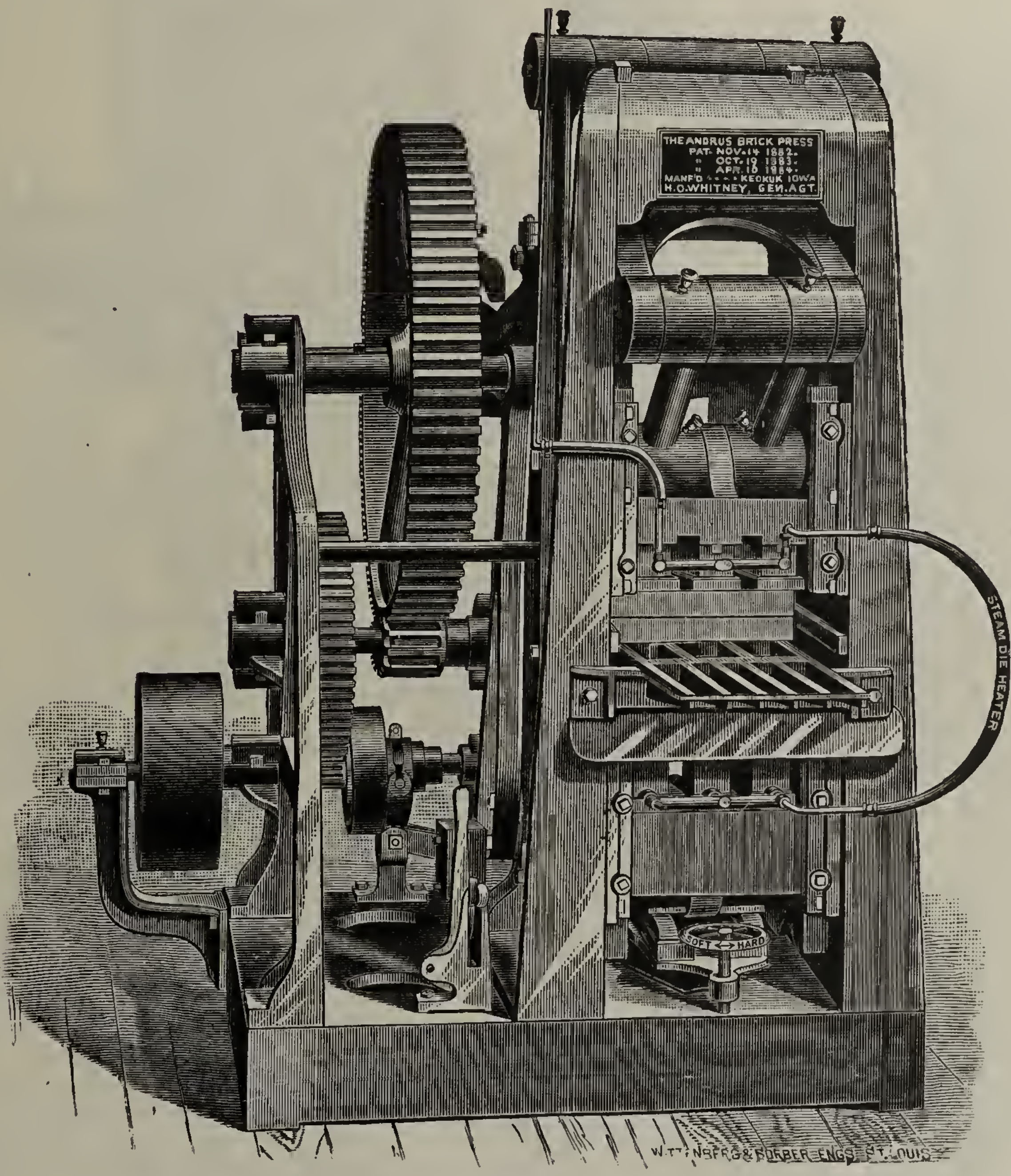
Laclede Building, ST. LOUIS, MO.



—THE—

Improved Andrus Double Pressure Brick Press.

UNRIVALLED FOR SIMPLICITY, POWER AND DURABILITY.



Our new **4 Mould Machine** has a capacity for 25,000 pressed bricks per day. We build at our own Factory Two, Three and Four-mould Machines which we guarantee in every particular.

For terms, etc., address

H. O. WHITNEY, Gen'l Agent,

General Office and Factory, KEOKUK, IA. (Mention the Clay-Worker.) KEOKUK, IOWA.

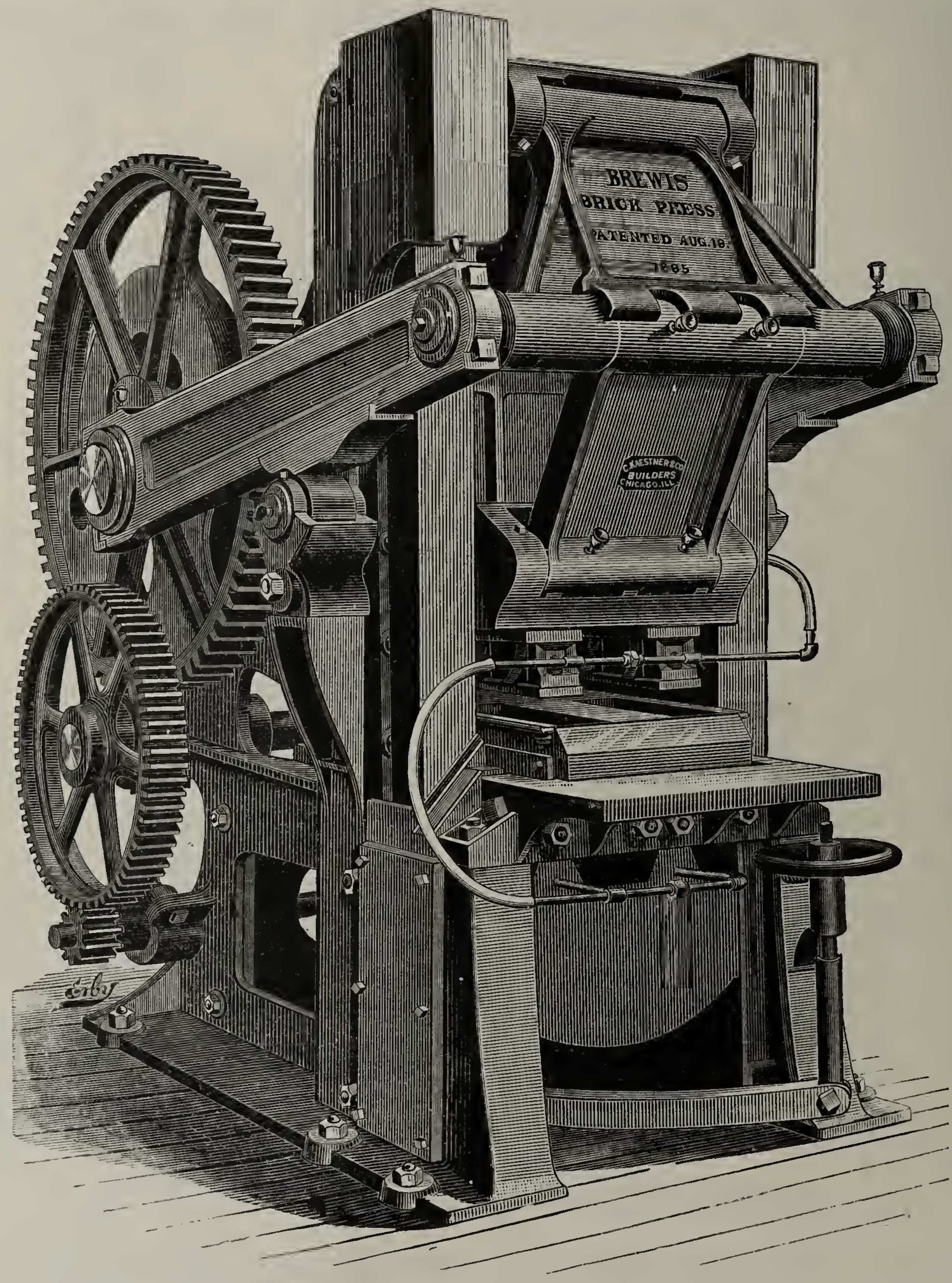
The Brewis Patented Brick Press.

SIMPLE AND DURABLE.

Guaranteed to make as many Perfect Brick ver mould as can be made on any machine now in the market. We except none.

Fully covered by patents. **We protect our purchasers**

Capacity 8,000 to 16,000 a day depending upon the clay



Shipped to responsible parties on 30 to 60 days trial.

Guaranteed against breakage for Two Years.

We furnish the Boyd and Raymond Pulverizers at prices that defy competition. Send for Circulars and Prices to

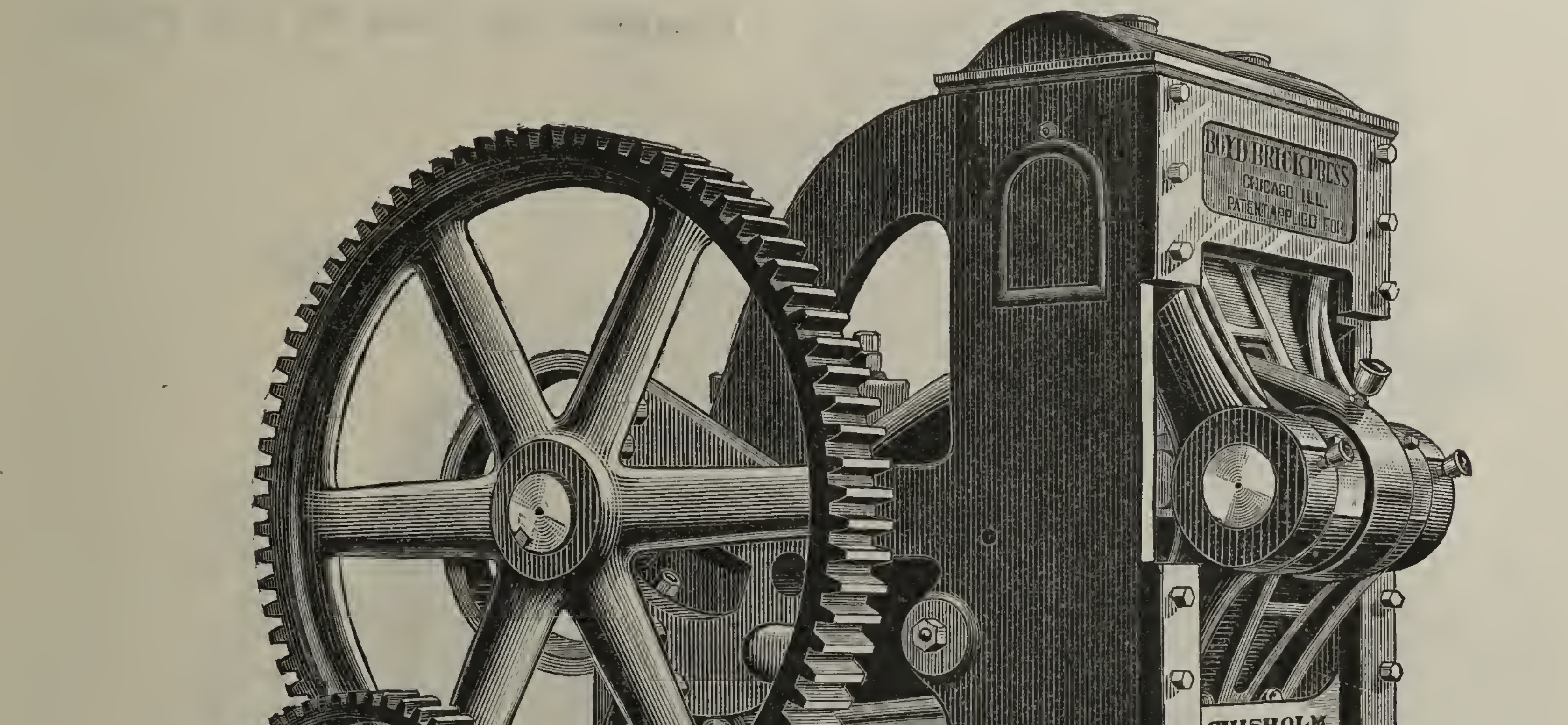
CHARLES KAESTNER & CO., Machinists and Founders,

ENGINES, BOILERS, PUMPS, SHAFTING, PULLEYS, HANGERS, ETC.,

[Mention the Clay-Worker.] 303-311 South Canal Street, CHICAGO, ILL.

THE BOYD BRICK PRESS

Will make a greater quantity of Perfect Brick (of maximum weight) per mould for a consecutive number of days than any other Semi-Dry Brick Press in the world and Superior in Quality to Hydraulic Pressed Brick.



☛Correspondence Solicited.

CHISHOLM, BOYD & WHITE,

86 Adams Express Building, CHICAGO, ILL.

St. Louis Iron and Machine Works, Iron Founders and Builders of Heavy Machinery.

ESTABLISHED 1854.
INCORPORATED 1875.

Office and Works: Main St. and Choteau Avenue,

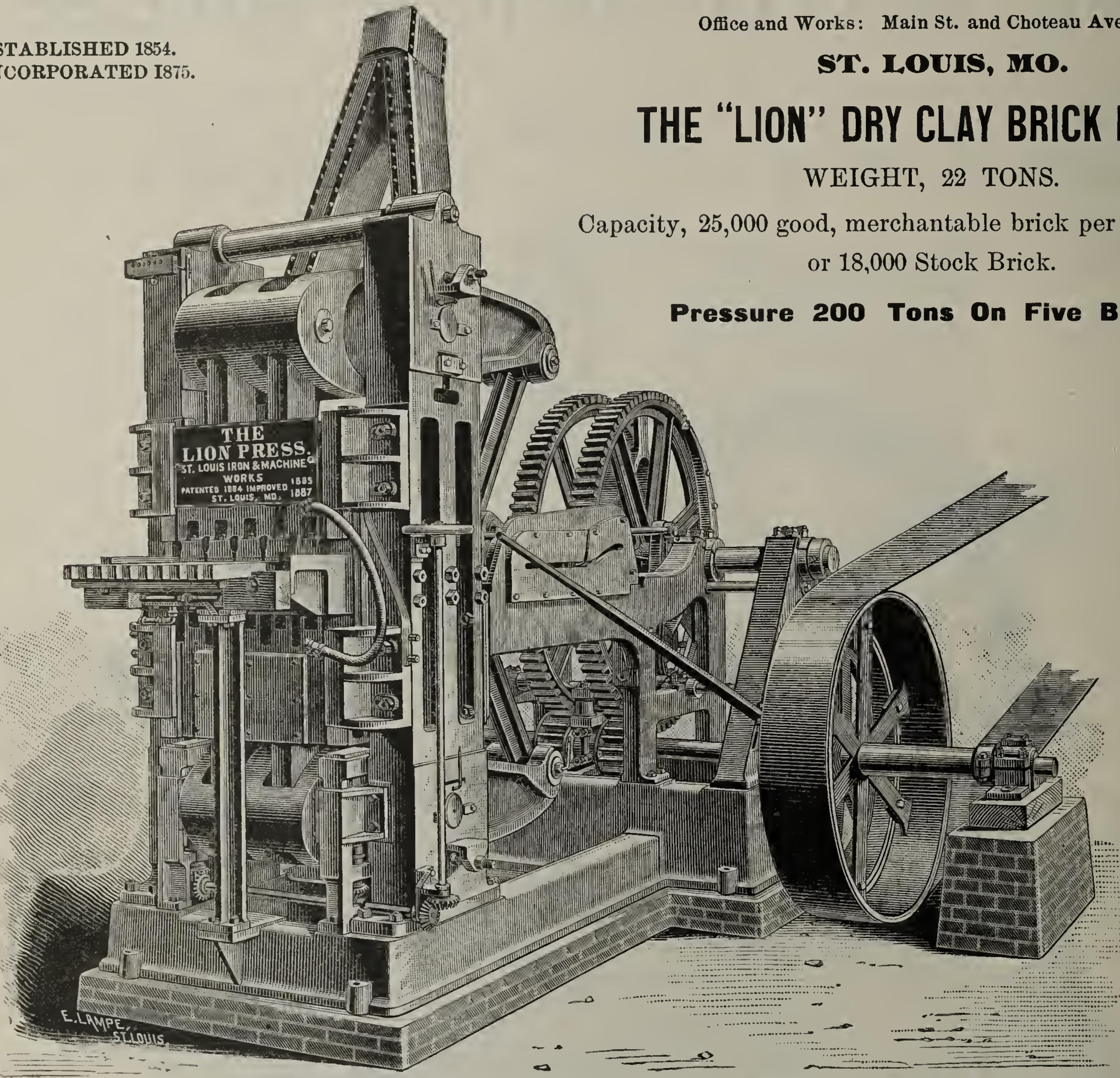
ST. LOUIS, MO.

THE "LION" DRY CLAY BRICK PRESS.

WEIGHT, 22 TONS.

Capacity, 25,000 good, merchantable brick per working day, or 18,000 Stock Brick.

Pressure 200 Tons On Five Bricks.



We claim the following essential features and advantages for our Machine:

1. The main feature of this machine is its great strength, power and durability. The pressure on each brick being 40 tons, and the working parts are so strongly constructed that there is no spring or give under this working strain. 2. The great simplicity and openness of framing and construction, so that every part of the machine is easily accessible for inspection, lubrication and adjustment, thereby reducing the necessary repairs, incidental to every Brick Press, to a minimum. 3. Pressing 5 bricks at each revolution of Machine, keeps the regular force of off-bearers and setters fully employed, which a 4 Brick Machine cannot do. 4. The adjustment of machine from common to stock brick and vice-versa, can be made in a few minutes' time.

Besides the Press, we manufacture and furnish a complete set of clay preparing Machinery, Elevators, Mixers, and Rollers; also Engines and Boilers complete. We also build different kinds of Steamboat Machinery and Steam Boilers, Corliss Engines, Cotton Compresses, Water Work Plants, Coal and Mineral Mining Machinery, Bridges Work, Hoisting Travelers, Cranes and Elevators; also general and large castings and Machinery. Any further information cheerfully given.

TESTIMONIALS.

St. Louis Iron and Machine Works, St. Louis, Mo. KANSAS CITY, MO., September 28, 1888.

GENTS: The two "Lion" Presses I bought from you about two years ago have given me entire satisfaction. As a dry clay press I think they have no superior. I prefer the "Lion" to the "Hydraulic". Ever wishing you success with the "Lion," I am,

Very Truly Yours, DRURY UNDERWOOD.

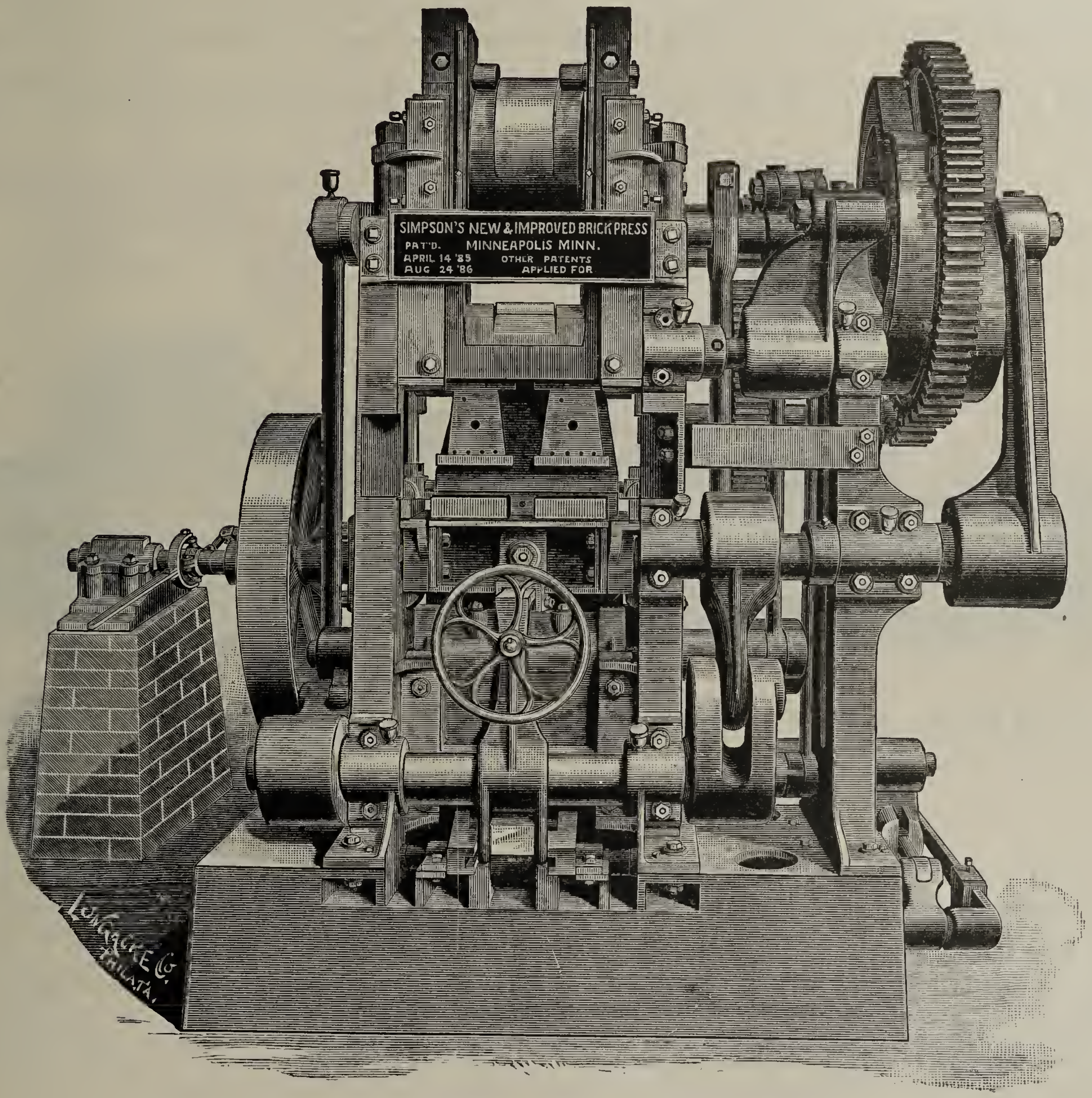
OFFICE OF
TENNESEE BRICK MANUFACTURING CO.,
NO. 7 MADISON STREET,
MEMPHIS, TENN., September 28, 1888.

St. Louis Iron and Machine Works, St. Louis, Mo.

GENTLEMEN: In reply to yours of 25th inst., we beg to say that our Company contracted with you last spring for one of your "Lion" Brick Machines, having concluded, after our President and Superintendent had thoroughly investigated most of other machines, including the Hydraulic, that yours possessed more advantages and promised better results. In due course the machine was delivered, set up and put into operation. After having operated it all summer to full capacity, we are more than pleased with results and can heartily recommend the Machine to any one contemplating a purchase. To fully appreciate the merits it must be seen performing work.

Wishing you that eminent success which you so well merit we remain Yours Truly, C W. EDMONDS, Sec. and Treas.

SIMPSON'S NEW AND IMPROVED BRICK PRESS.



Send for particulars and prices

SIMPSON BRICK PRESS CO.,

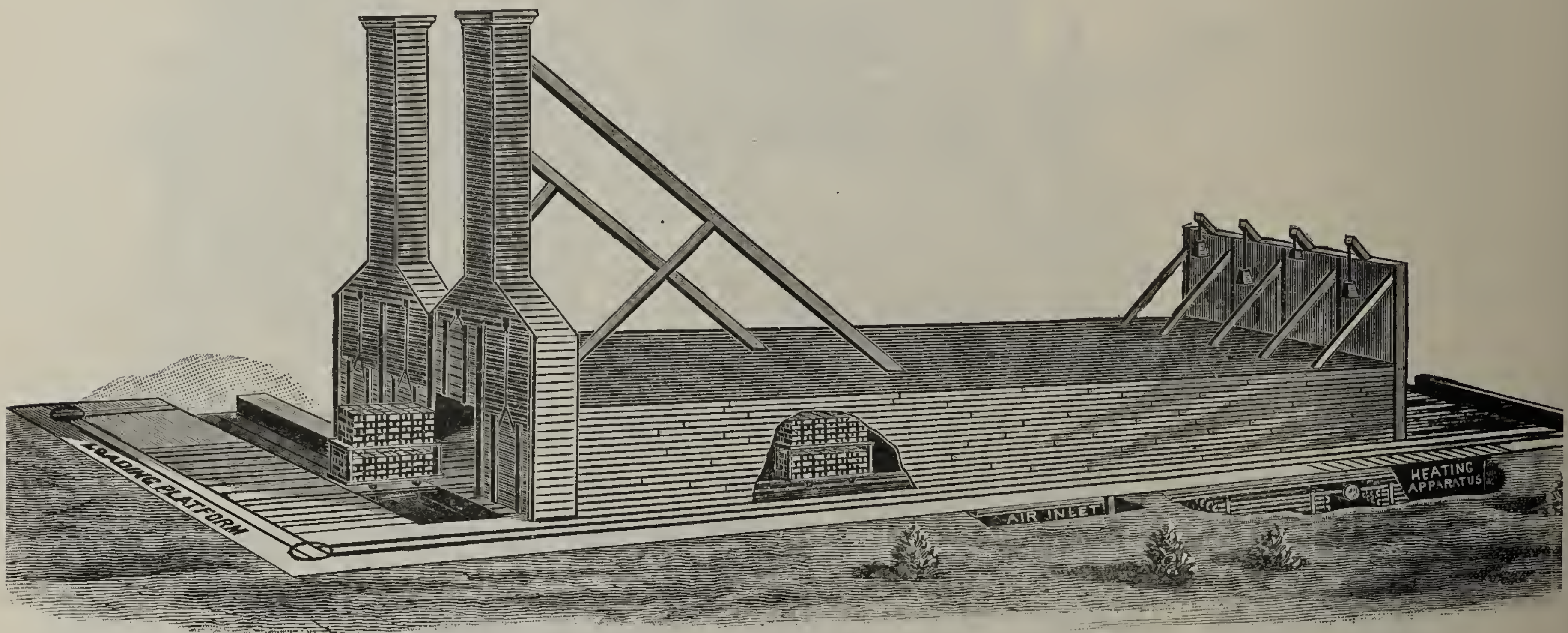
Room 91, No. 159 La Salle St., CHICAGO. ILL.

BRICK DRYERS.

We are prepared to erect Dryers to dry any clay.

YOU SAVE EXPENSE OF SHEDS.	NO FROZEN BRICK. . . . .
. . . . YOU WORK DURING ENTIRE YEAR. . . .	. . NO INTERUPTIONS BY RAINY WEATHER .
YOU SAVE TIME AND FUEL IN WATER SMOKING	NO DELAYS BY WAITING FOR DRY BRICK . .

WOOD BUILDINGS CHEAP TO CONSTRUCT



CHICAGO IRON-CLAD DRYER,

FOR ALL KINDS OF BRICK AND TILE.

This Dry House is a combination of the Drying Floor and Tunnel System. The radiation from the Iron Floor extending over the heating coils dries the lower tiers of bricks. The perforation of the Iron Floor gives an even distribution of the heat and prevents cracking. The steam heat is not so intense as to melt down the bricks or bake them. The bricks are dried smoothly and burn evenly, with a good ring. The water smoke is drawn off as rapidly as made, and the drying is even and gradual. Stiff mud bricks are hacked on double-decked cars. Soft mud bricks are dumped on pallets and cars carry the same through Dryer. Semi-dry and dry pressed bricks are specially provided for and can be dried without injury. Our buildings are constructed entirely of wood; are simple, cheap and easily erected. We furnish complete steam heating apparatus with pipes connections, Iron Cars, Turn Tables, Transfer Cars and Rails. Confer with us before contracting elsewhere. We will save you money, time and trouble. State character of bricks made, name of machine used and capacity required.

I. & M. WOLFF & COLEMAN,

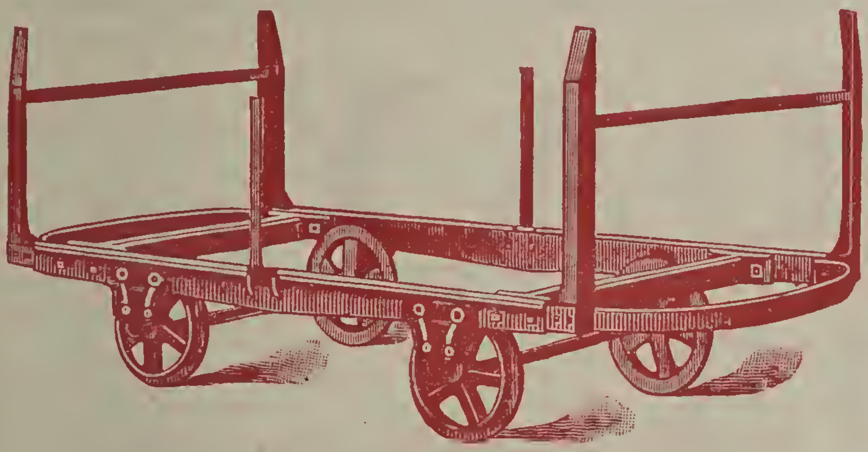
PATENTEES AND SOLE BUILDERS,

Write for catalogue.

No. 261 Dearborn St., Chicago, Ills.

The Iron Clad Steam Dryer.

It will pay you to have your bricks thoroughly and equally dried before setting in kiln. You can dry them more economically in our Steam Dryer than in the kiln, besides getting a more uniform burn and better bricks. Handling and wheeling bricks costs money and the bricks are often marred and in bad shape when they go to the kiln.

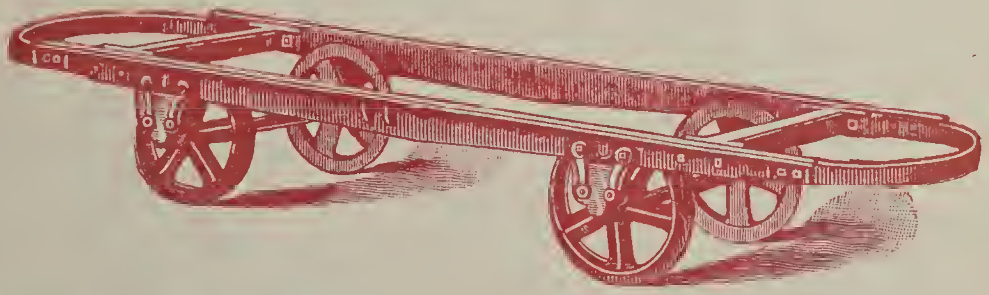


No. 1.

These trucks are strong and well made throughout, and the axles run in anti-friction rollers and are easily handled by one man:

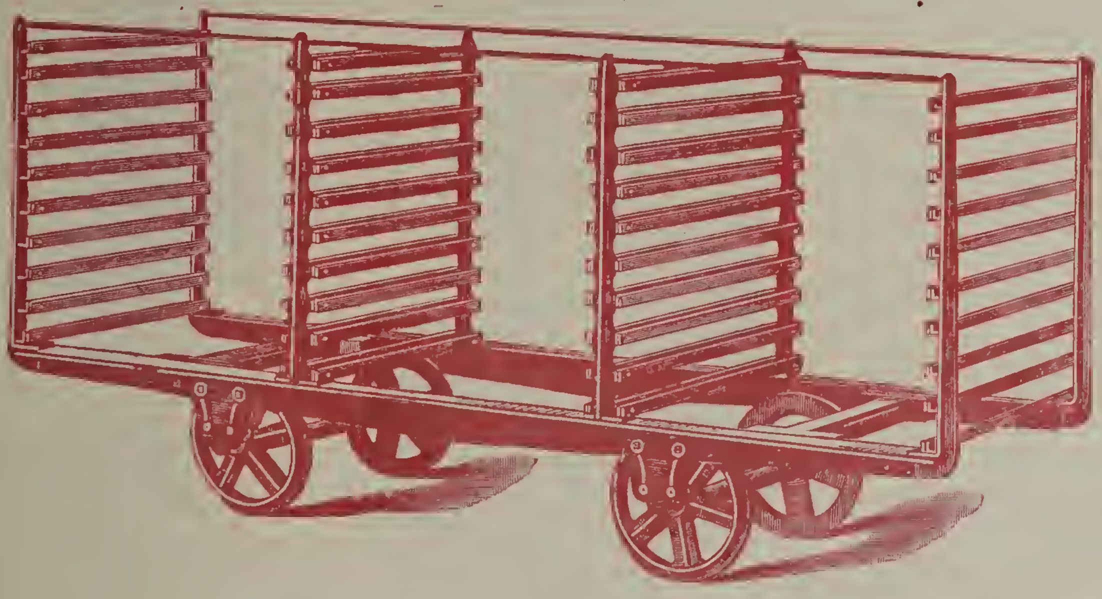
Cut No. 1 shows our double decked car, which we use for all the varieties of brick, sufficiently stiff to be haked; on the lower deck of which we hake four tiers high, and on the top deck, five. This car is suitable for all of the stiff mud brick made by the various Die machines. It is also adapted for the drying of dry pressed and semi-dry pressed bricks.

Cut No. 2 is a simple frame car which is used for foot pallets, or this car can be converted into car No. 1 or 3.



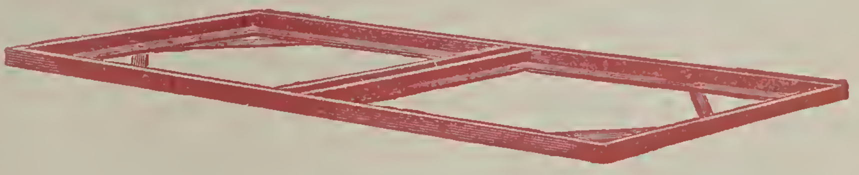
No. 2.

Cut No. 3 is for bricks that are too soft to hake and when pallets are necessary.



No. 3.

These racks, together with the car, are constructed entirely of Iron. They will be found stong, light and durable, and afford the best method of using pallets. They do away with the use of the foot pieces on the pallets which are so much annoyance in handling. The pallets are made to slide upon the wrought iron bars, which act as braces for the posts. We make these racks for the pallets to slide in lengthways of the car, so as to bring the side of the bricks towards the heat and also afford conveniencies of putting in and taking out the pallets. You can reach across the car easier than lengthwise of it. These cars are 8 feet 6 inches in length, and 34 inches wide.



No. 4.

Cut No. 4 is a substantial as well as a light frame—made entirely of wrought angle iron and strongly braced, which is to be used for a top deck in the car in cut No. 1. ADDRESS

I. & M. WOLFF & COLEMAN,

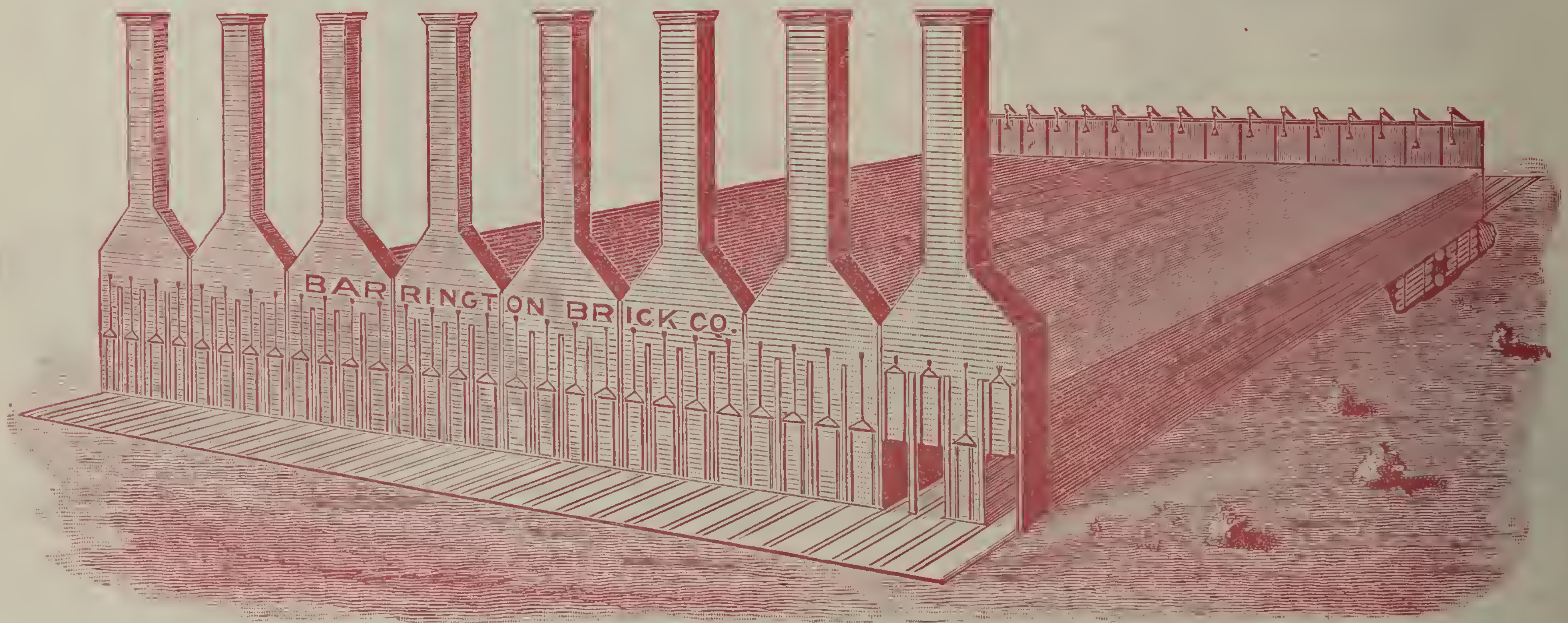
261 Dearborn Street, - - 14 Third Avenue,

CHICAGO, ILLS.

DRYING

75,000 Bricks

PER DAY.


BARRINGTON BRICK CO.

OFFICES: { 50 BROMFIELD ST., BOSTON, MASS.
9 CUSTOM HOUSE ST., PROVIDENCE, R. I.

PROVIDENCE, R. I., July 20, 1889.

Messrs. I. & M. Wolff & Coleman, Chicago, Ill.

GENTLEMEN: We have deferred answering yours as we desired to get a full test of the Dryer, and now will say to you that we have had the Dryer in *successful operation* for several months, giving us a *daily capacity of* 75,000 *bricks.* By its use we are not interrupted by weather, and in addition to the money we save in handling, we get a less percentage in breakage than by any other method. We believe that steam heat is the proper principle to dry bricks as it seems to dry more uniform than furnace heat and we can control the drafts and temperature better than we could in any furnce dryer.

The wear and tear on the Dryer and on the cars is very small in our Dryer, and the bricks are in first-class condition and being well dried, we save time and fuel in shortening our water-smoking. We are more than pleased with the Dryer in every particular and would recommend it to any brickmaker who desires to get first-class results. To fully appreciate this Dryer parties should see it in operation, and to any of these we would be glad to show our plant. Yours Truly, W. K. LOGEE, General Manager Barrington Brick Co., Barrington, R. I.

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THE CLAY-WORKER

VOL. XII. INDIANAPOLIS, IND., OCTOBER, 1889. No. 4

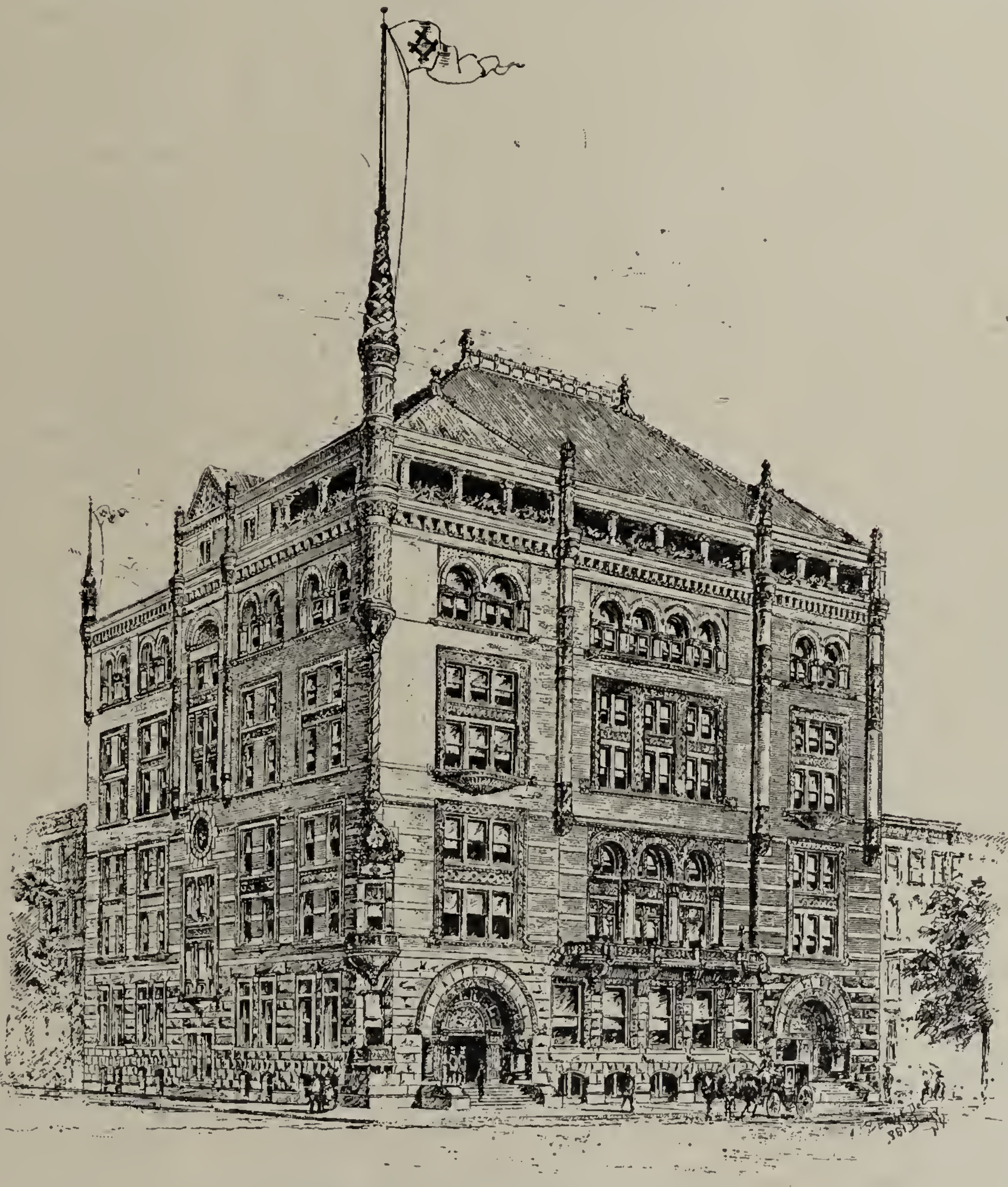
Written for the Clay-Worker.

EXAMPLES OF AMERICAN BRICK AND TERRA COTTA WORK.

No. 20.

THE MANHATTAN ATHLETIC CLUB-HOUSE, NEW YORK CITY.

Plans for the finest athletic club-house in the world have been drawn by order of the Board of Governors, of the Manhattan Athletic Club, of this city, by P. J. Lauritzen, architect. In its appointments and æsthetical luxuries it will be a dream that would have delighted the effete emperors of ancient Rome. By the first of next January an edifice of noble proportions, and adding to the architectural beauty of Madison Avenue and Forty-fifth Street, will be completed, and the marble stones in front of it on the sidewalk will have these words chiseled thereon: "Manhattan Athletic Club." The facade of the building will be imposing, and the general architectural design of the Renaissance period, dashed with a little flamboyant Gothic. But the beauty of the exterior will not compare with the elegance and the refined sumptuousness of the interior. The confirmed sybarite, the hardened athlete, and the refined scholar, will find a paradise within the various apartments fitted up for the pleasure and benefit of the members. The basement and first story will be of Seneca and Carlisle red stone, the upper portion of pressed brick with terra cotta trimmings.



THE MANHATTAN ATHLETIC CLUB HOUSE.
P. J. Lauritzen, Architect.

The building and everything complete will cost $600,000. An unusual and interesting feature of this club palace is one of the largest swimming baths in the world. It is located in the basement and will be 100 feet long by 21 feet wide, and will be kept constantly filled with clear, pure water. It will be a liquid pool in marble. An ingenious and artistic foot-board called the leap, will be erected at the end of the bath to give the more adventurous of the members a chance to leap high and descend gracefully into the water. At various points comfortable little climbing-out places will give the swimmer an opportunity to leave the water without disturbing others who may be enjoying the plunge. The facilities for approaching and leaving the bath will be unexcelled. The shooting gallery is to be in the basement also, and will have a range of 135 feet. Excavations will be made under the sidewalk to permit the range to be ten feet longer than the building. The crack shots of the club will have a chance to practice night and day. Electric lights will keep the range as light as day. Besides these, six bowling alleys will occupy the last available space in the basement. Many of the club members are fond of bowling, and the alleys will be models of their kind in every respect. They will be erected with a view to permanency, and will be so smooth, level, and substantial that time and use will not put them out of plumb a hair's breadth. All the balls and pins will be made by special contract. In all other respects the building will be constructed and furnished in a like manner, no expense being spared to make it an attractive and elegant home for the members of the club for whom, 'tis said, the best is none too good.

Unless all signs fail, it will be the boss club-house of the world.

Written for the Clay-Worker.

BRICKMAKING AND BURNING.

No. 7.

BY J. W. CRARY, SR.

In my last article, No. 6, I showed the difference between burning soft tempered clay brick and brick made of comparatively dry pulverized clay, under heavy pressure. As there are many who do not understand why all kinds of clay may be pressed into a brick without cracking, when it is dry and well pulverized, while perhaps the same clay will crack by hot sun drying, or in a dryer, I will repeat what I have before said, that all clays of a mealy or limy character, will crack in drying, unless dried very slow. But such clay could be dried on dryers if put on pallets and the dryer closed steam tight, and then kept full of steam until the brick would be heated clear through; then the steam turned off and hot air, about 212 degrees Fahr., turned in on the brick. It is obvious that the brick would not crack by exposure to steam, as that would slightly expand the brick and of course there could be no shrinkage of the clay until the steam would be turned off. Then if dry heat were turned on the brick no greater than the heat inside the brick, it would only aid and hasten the evaporation of the hot water inside the brick. The surface would not contract but very little faster than the center of it, because the steam inside would keep the pores open and the shrinkage would be thus equalized and as soon as the steam would be out of the brick, the whole body of particles of clay would assume at once their (crystallized) form and a compact mass, unchecked and without crack would be seen.

Now here is the proof of this thing, and I want the old brick burner who generally knows all about the effects of what he does, while not one in fifty of them knows, or ever studies the causes, to mark well my statement here. You know that when you set fire to your kiln you must necessarily go slow, first, because you cannot make a fire go fast as you have no draft to make your fire burn. Second, you know that if you fire too fast you would get up such a hot steam that the brick would get soft and "water-settle," but with slow firing the brick become saturated with steam so, as the dry heat follows after, the steam escapes without cracking or water-settling the brick, and the dry heat naturally takes the place of the steam heat without disturbing the cohesiveness or crystallization of the clay.

THE REASON WHY THERE ARE SO FEW SCIENTIFIC BRICK BURNERS.

What are termed the learned professions, are acquired, held and practiced, because all have certain fixed formula and principles laid down and recognized as paramount in the use and administration of any particular science. No one would be tempted to practice a science contrary to established principles. There may be novelty in the practice, but the principles must remain intact. Not so in brick burning and making: It is all "hotchpoch" or "hotch pot," as lawyers say, with brickmakers. The public have never asked or deemed it necessary to have a perfect brick made and burned on scientific principles. As a rule, when a job of brick work is to be done, estimates are called for to be made on certain plans and specifications, and the terms "good building brick," "good hard brick," "mercantile brick," or "well burned brick," are employed, without any special or particular qualifications. These terms in common technical parlance, means, that as good brick as is made in the localities where the work is to be done, or in the market, should be used. The very best in the market may be very bad or imperfect brick, but the builder says, a brick is a brick, and the architect has no formula for a good brick, and many of them do not know a perfect-made and burned brick from an imperfect one, made from the same clay. A brick may look well on the surface, but when broken across the middle, may show only a crust of half an inch that is well burned, which shows that the heat necessary to burn a brick perfectly, was not continued long enough to make a uniform hardness, and as most brick is made of clay that will shrink under certain degrees of heat, of course, the surface of the brick being harder than the inside, there is an unequal contraction throughout the body of the brick, and the outside is on a strain or sort of tension over the inside, so that a light stroke or uneven pressure will break the brick. It is safe to say, that more than half the brick made and burned, are thus imperfect in the quality of strength and yet we have no fixed rules for judging a brick. We see tabular statements of the strength of bricks to resist pressure, etc., but little or no reliance can be placed on them, as two brick of the same clay and external appearance, may vary in power of resistance to certain given forces, as two or three to one.

The highest possible proof that brick is the most superior building material in the world is the fact, that outside of an occasional job of public brick work, the entire brick work of the whole world is imperfect in all respects excepting, perhaps, the purpose and plan of the work, and yet brick are preferred to all other materials for building. Brick can be so made and burned, and then put together with cement, that after a year or more, the mass in any shape would be equal in strength to any kind of stone, and far superior when exposed to frost or fire, yet, as imperfect as our brick work is, it is the first and foremost in real economy and durability. A demand for a standard perfect brick will give us perfect burners.

So long as the general public are satisfied with all sorts of brick there will be all sorts of brickmakers and burners, but once fix a scientific standard for brick, and that will produce the men of talent and capability to produce brick. Supply and demand are the omnipotent regulators of the whole business of the world. If the option is with demand and he don't get the best that is made it is his own fault. Brickmaking has been regarded as a sort of a mean, dirty business, followed only by ignorant, vulgar mud larks, ready for a "tough and tumble" tussel at anything; but the art is coming up. Capital and brains must go together to win, and the demand for intelligent brickmakers and burners, will induce young men of fitting capacity to engage in the art with a purpose to master all its intricacies, and understand its various phases. A first-class expert, scientific brick burner, or clay worker of any kind, will take rank in the front of all the mechanical and skilled pursuits. I doubt not that a sort of a university, or school for the practical and theoretical training of the right kind of young men in the clay working arts, would be a great success, and would result in very great improvement to the real economy, efficiency and durability of our best building industry. We want more clay work and less wood work; we want more single tenements, and broader and longer streets to make our cities more healthy and moral. Our rapid transit and facilities for cheap and easy transfer of goods and people, have effectually disposed of the need of narrow thoroughfares, little lots, and high and massive buildings. Fire, health, morals, comfort and all, demand a radical change and it will come.

A brick building for any purpose is much the cheapest in the long run. I have built houses with six rooms with 25,000 brick. I put the outside course of brick as usual, on "the flat," and set the inside on edge, leaving an aperture of nearly two inches between the brick on edge and outside course. Every 6th course is a "header," or bond course. This wall has two great advantages. First, it is about twenty per-cent. cheaper than a solid wall of the same thickness, and just as strong. Second, and yet more important, the hollow, or aperture, is a perfect non-conductor of heat and cold, as well as of dampness. No "furring" is necessary, both "stripping and lathing" is saved and less mortar and a better job of plastering is done, and no "burrow" for mice, or bugs is left, and the liability to fire is lessened. A brick house built two stories high on this plan, is as cheap as a frame house, if the frame be done in first-class style of workmanship and material. I have said nothing of the difference in *insurance* and durability. When all advantages are considered, it is a wonder that brick are not used almost exclusively as a building material.

The old prejudice against brick walls, which is mere superstition, would be disposed of by my plan, everybody could have a cheap, warm, strong, dry, house to live in, and not pay a cent of royalty, as I have built these kind of houses thirty years ago, and don't propose to patent them, beyond the *copyright* of these articles.

[Copyrighted.]

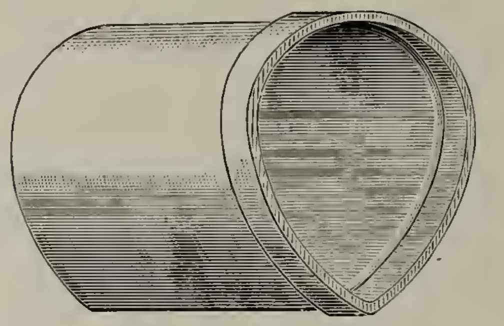
Written for the Clay-Worker.

SEWER PIPES AND THEIR MANUFACTURE.

BY ALFRED CROSSLEY.

[CONTINUED.]

I have heretofore remarked that sewer pipes may be correctly regarded as a coarse stoneware. But the ordinary stoneware body would not do for sewer pipes. It is much too fine for the thickness required in sewer pipes, and would be liable to crack and warp in drying, blister in burning, and air-shake in cooling. Nevertheless we retain the distinguishing characteristics of stoneware, viz., a vitrified body covered with a salt glaze, and so long as these are present we have a true stoneware. But with this in mind it is probably safe to say that not over one-half of the sewer pipes made, either in England or America can be classed as stoneware. In England I know this to certainly be the case. And yet the manufacturers do not hesitate to perpetrate the transparent fraud of advertising their pipes as "stoneware." The reason for this is that the first development of this industry was in a stoneware body. Afterward came the use of fire clay, in the use of which was less liability to risk and loss in manufacture. These fire clay pipes are burned at a high heat and take a heavy salt glaze, but as I have said, many firms adopted the title of stoneware for these fire clay pipes. Although, as I have said, very well glazed, the body was not in the least vitrified, being made of fire clay of too pure a quality. Hence their unsuitability, for sewage purposes. A glaze, however good, is not sufficient of itself to render the pipe impervious. I have demonstrated this myself by putting water in a well glazed fire clay vessel, alongside a stoneware vessel with the same quantity of water in, and while the water in the latter was retained, in the fire clay vessel it would gradually make its way through. On this subject, another writer has said: "A nice looking glaze, however, is not always proof of a good, sound pipe; in fact some of the most porous and friable clays take the best glaze, and some again are easily affected by acids and other chemical substances that are to be found in sewage. This is a fatal weakness, since the chief merit, of the stoneware pipe is its resistance to the influence of practically all acids in sewage, which on the other hand are so fatal to metal pipes of all kinds." Although, as I have said, the use of this class of pipes, on account of its fine glaze and appearance, has been allowed, the engineers have recognized a difference in strength, in the fact, that while the thickness of stoneware pipes is specified at one-twelfth the diameter, the thickness of fire clay pipes is required to be one-tenth the diameter. I have been informed, however, that in the last few years there has been a gradual reaction in favor of the genuine stoneware pipe. The most absolutely perfect sewer pipes that it has ever been my privilege to see were the stoneware pipes of Doulton & Co., Lambeth, London. In this country there have been and are still, large quantities of sewer pipes made that are not vitrified. If I am not mistaken the bulk of these are to be found at the Eastern factories where the Albany slip glaze is chiefly used. Of this I will speak further a little later. Inferior fire clays, as already described, suitable for sewer pipes, are found in Hancock Co., W. Va., Jefferson Co., O., Akron and New Lisbon, O., near St. Louis, Mo., and other places, and hence the location of the industry on a large scale at the points mentioned. Those made in the Akron district are of exceptionally good quality and deserve to be specially mentioned. It can hardly be gainsaid that they are the best in this country. Any one of several reasons may be sufficient to render a clay unsuitable for sewer pipes. It may be too weak in the fire, that is, it may vitrify too quickly, and hence either melt down entirely before salting heat is reached, or if it retains form sufficient to take glaze, it may still be worthless, as the nature and strength of the clay is all burnt out. I know of no remedy for such a clay, except—not to use it. On the other hand the reverse may be true, as already spoken of, where the pipe although well glazed is not vitrified. This may be remedied by thoroughly tempering the clay and thoroughly mixing with it one or more weaker clays, in proportions to be determined by experiment. Then we may find a clay that will crack and warp, or contract too much, hence having a liability to "spring" in the joints of branches, etc. This may be remedied by a mixture of other clays or by the mixture of one-fourth to one-half of calcined clay. Again, another clay may be in most respects well adapted but may refuse to take a good glaze. The reason for this, I am not enough of a chemist to determine, but think it may be due to a deficiency of silica in the clay, though I presume there may be other reasons. M. White, of Fort Dodge, Ia., writing on this subject says: "I know by practical test that not all clays will take a salt glaze, no matter how hard the burn may be, or to what height the heat may be raised. Some clays will either melt or almost burn up, and yet take no salt glaze. One reason for some clay not taking salt glaze is that it contains too much lime, iron and sulphur." I think Mr. White is right as to the lime and sulphur, but cannot agree with him as to the iron. In fact a clay may contain so much iron as to spoil it for sewer pipes, coming out in very fine pimples, like a rough rash all over it, and yet take a good salt glaze. This may, perhaps, be a proper place to give some specific description of both slip and salt glazes, and why I give my opinion in favor of the latter. What is known in the trade as "slip glaze" or "Albany slip" is a mixture of clay and water, the value of the clay for this purpose depending upon its impurities, viz., iron, lime, magnesia, soda, potash, etc. These are its fluxing properties, which cause the slip to run when under fire and form a coating of impure glaze or gloss upon the ware. Salt glaze is formed by the combination of the soda of the salt with the silica of the ware itself, forming a pure gloss which becomes as absolutely a part of the ware as the clay in the body of it. The salt being thrown into the kiln when the heat is at the right point, is vaporized or volatilized, and is quickly decomposed by the steam and smoke into hydrochloric acid and soda, which, uniting with the silica of the burnt clay forms a silicate of sodium or soda glass, covering every portion of the wares exposed in the line of draught. As another writer has said: "It requires good clay to endure heat of sufficient intensity to vaporize the salt, and this heat is so great that the pipes are vitrified and very hard, and glazed inside and out." I have intimated a superiority of the salt glaze over the slip glaze. In what respect does this consist? The salt glaze, as I have shown, is absolutely part of the pipe itself, and without the silica contained in the clay could not be formed. The slip glaze on the other hand is a glaze *of itself*, independent of the pipe which it covers and although in fact, as a rule, *adheres to* the pipe is not *part of* the pipe, and hence there may be conditions in which the glaze would become detached from the pipe, as in fact I have occasionally seen in imperfectly burned pipes. Then in the salt glaze, if good sewer pipe clay be used it is an impossibility to glaze the pipe without also vitrifying, or at least semi-vitrifying the body. In slip glaze the opposite is true, it may and does often happen that the heat may not be sufficient to vitrify the pipe, and yet the slip be run. An inspector in the Brooklyn (N.Y.) Health Department, in writing on this subject claims as an advantage for the slip glaze pipe, that the parts to which cement is to adhere (viz., the inside of the socket and about two inches of the spigot end of the pipe) can be wiped off after being taken from the (glazing) bath, so that a porous condition can be preserved at the jointing point. Now, although this may in one sense be an advantage, yet it is contrary to the principles I have already named to have a sewer pipe porous in any sense or degree. If the principles as I have stated them be true, and the conclusions drawn from them correct, then we are compelled to admit that the evidently most proper and suitable glaze for a sewer pipe is the salt glaze. It makes the most perfect and homogeneous glaze, and is besides, where a proper quality of clay is used, a sure and reliable index to the quality of the pipe itself. As before stated, when the pipe is made of a proper quality of clay, it is impossible to give the pipe a salt glaze without raising it to a sufficient heat to insure its vitrification, and hence when a salt glaze pipe is only partially glazed it is almost certainly non-vitrified if not soft, and should be rejected for sewage or water works use. A salt glazed stoneware pipe carries its character on its face. Some remarks as to shape, sizes, lengths, and other mechanical features of sewer pipes may perhaps now be in order. The ordinary and usual shape of a sewer pipe is round or circular. This remark may be considered by some of my readers as superfluous, inasmuch as they never saw any that were any other shape than round, except by accident. And so far as I am informed none but circular pipes have been made in the United States. And if I were a manufacturer I should wish there never would be any other shape except at a large advance in the price. But in England oval or egg-shaped pipes have also been largely made, though within the past few years the proportion of egg-shaped pipes in use has become much smaller. Below is a cut of a pipe of this shape.



Up to a few years ago every extensive firm made both shapes of pipe, but now some of the largest factories have not an egg-shaped die about the place and in fact do not pretend to make them, while those firms which do make them, do so principally to order only.

The principle of the egg-shaped pipe is scientifically a good one. It is well-known that the deeper the flow of sewage the less likelihood of its solid particles being deposited, and thus accumulating. In this shape of pipe when the volume of sewage running is reduced, it is contracted into a much narrower channel than in a round pipe, and hence the flow of its solid particles is facilitated. Another point of advantage is that the egg-shaped pipe will sustain a greater crushing weight than the round one. Nevertheless the egg-shape has been gradually superseded by the round, and in this country has not gained a footing and I suppose that for no other reason than that a good round pipe practically answers all requirements made of it, and is besides so much more convenient to every one concerned.

The principal sizes in which sewer pipes are made, are from 3-inch to 24-inch in diameter, with several of the intervening sizes omitted. After leaving 12-inch the sizes generally increase by steps of three inches at a time; 7-inch pipes are seldom made, and 11-inch I think never. Two-inch pipes are also made by most firms, but in my opinion their use should be entirely prohibited, except in some cases where they may be useful for conveying fresh water supply, and even then I would say use a 3-inch pipe. One thing I am confident of, two-inch pipes are of no benefit to the manufacturers, for they cost practically as much as 3-inch, while for any kind of sewerage purposes it is a waste of time and money to put them down. Sewer pipes are also made in larger sizes than 24-inch, but to a limited extent. A few firms make also 30-inch to 36-inch, and in some cases even as large as 48-inch. This is the largest size I ever saw, and if I am not mistaken the largest that have ever been made for actual use in sewer construction. The manufacture of pipes beyond 24-inch or 30-inch diameter is attended with some difficulties. A clay pipe four feet in diameter, even after it is burnt, is not one of the handiest things to fool with, and the difficulty, care, and risk attending the handling of such a pipe from the time it is made by the machine to being safely set in the kiln may be imagined. I believe the Laclede Company, of St. Louis, claim to have made a pipe 6 ft. 6 in. or 7 ft. in diameter, but in the absence of any positive testimony, I cannot believe that such a pipe was ever made by the machine, dried in the shed, and from there set in the kiln, nor do I believe that with any appliances hitherto invented, the manufacture of pipes of such a size for regular sewerage use is at all practicable. I do not doubt that the company may have made such a pipe, but if so it has been built up by hand, in the kiln, left there to dry, and never moved till after being burnt, and its use has been intended for show or advertising purposes.

The best and most suitable length for sewer pipes is a matter of some importance. In this country, all sizes, are, as a rule, made in two-foot lengths, to which there are but few exceptions. Is this length sufficient? I think not. It will be hardly disputed, that from the standpoint of the sanitary engineer, sewer pipes should be made in as long lengths as possible (that is, as a rule), so that the number of joints may be reduced to a minimum.

In the early part of this paper I referred to a reported attempt to make pipes 5 feet long. I have no idea that any sewer pipe maker in America is going to waste any money over any attempt to do such a thing, but for pipes of 21-inch diameter and upwards such a thing would be highly desirable if practicable. But is there any necessity to make pipes as short as 2 feet? In Germany all pipes are made 3 feet in length. In England they are made in 2 feet lengths up to 9 or 10-inch, and some makers up to 12-inch. Above that they are made in 2 ft. 6 in. and 3 feet lengths. In Scotland the Garukirk Company make 2-inch and 3-inch pipes in 2 ft. or 2 ft. 6 in. lengths, and all over 3-inch in 3 ft. lengths. There is an objection, however, to making small size pipes over 2 ft. in length, as above that they are liable to become crooked in burning. My idea would be as follows: All sizes up to 6-inch or 8-inch in 2 ft. lengths, from that up to 12-inch in 2 ft. 6 in. lengths, all over 12-inch in 3 ft. lengths, and in the very largest sizes 4 or 5 ft. lengths if possible. Or drop out the 2 ft. 6 in. lengths altogether, and make all over 8-inch in 3 ft. lengths. I am certain that the manufacturers would find it to their interest to adopt this, as it would increase the product of the machine or pipe press. By making pipes 3 ft. long they would only have two-thirds the number of sockets to make, and as it takes nearly as long to make a socket as to make the pipe itself the advantage must be apparent, besides the mining, grinding, and tempering of the extra clay used in these surplus sockets.

[To be continued.]

A Foregone Conclusion.

Canvasser—I have here a work—

Master of the House—I can't read.

Canvasser—But your children—

Master of the House—I have no children (triumphantly). Nothing but a cat.

Canvasser—Well, you want something to throw at the cat. (He took it.)—*Life.*

BRICK STREET PAVEMENTS.

[The following extracts have been condensed from a paper by Mr. Edgar Ryan published in the Michigan Engineers' Annual.]

Clay, to make good paving brick, should be able, without fusing, to withstand a sufficient degree of heat, and for a time long enough, to render the brick hard and impervious to water. Fluxing agents are also necessary to render the brick homogeneous and tenacious. Among the clays that have been used more or less successfully for paving material, and the firms manufacturing them, may be mentioned the following:

The clay from which the Hayden Paving Block is manufactured is a "Mingo" fire clay, from Haydenville, Ohio. This clay has nearly the compactness and density of fine-grained sandstone, and yet is semi-plastic. Nitro-glycerine is used in mining it, but it is easily reduced to powder in the dry-pan under heavy rolls, and when ground it mixes easily, works smoothly, and resists great heat. The paving block is burned for ten days in a temperature of 2,000° Fahr. This block is square in plan, 5¾ inches on a side, and 4¾ inches deep; it is hollow below, to facilitate burning and to save material, and has a flat upper surface broken by indentations to provide a firmer foothold for horses. These indentations, however, are of little value as they are soon obliterated under heavy travel. The blocks are salt-glazed, and the outer top edges are slightly beveled to admit of a filling of sand, pitch, or other material. One thousand blocks will lay 29 sq. yds. at 50 cts. per hundred, or $1.92 per sq. yd. A block weighs about 9½ lbs. or 360 lbs. per sq. yd. An analysis of this clay was made by Prof. E. M. Reed, and it compares with the famous Stourbridge clay of England as follows:

	Mingo Fire Clay per cent.	*Stourbridge Fire Clay.* per cent.
Silica	72.24	73.82
Alumina	16.87	15.88
Iron	0.16	2.95
Lime	4.20	trace
Magnesia	trace	trace
Alkali	1.09	0.90
Water	5.44	6.45
Total	100.00	100.00

The paving brick clay of Virden, Ill., is found in a bed 25 ft. thick, just below a stratum of slate and 275 ft. below the surface of the ground. It is compact, with a distinct cylindrical cleavage, of a light steel-gray color, and when first mined emits the characteristic odor of slate. It is blasted, but can be reduced to an extremely fine powder, free from grit. It has a specific gravity of 2.5595. A piece of this clay can be kept at a white heat in a hard coal fire for twelve hours and not disintegrate.

The clays used at Bloomington, Ill., are surface clays of three varieties, *A* is a yellow, aluminous clay, very fine and plastic, and is found 3 ft. below the surface in a bed 12 ft. thick. It is simply tempered in a pug mill and burns to a grayish-red color. *B* is a hard-pan clay lying just beneath *A*. It is very troublesome to reduce to an impalpable powder. When dug, and left "to weather" for one winter, it gives good results. It burns from pink to cream in color. *C* is a blue clay from under *B*. It is fine, firm, very tenacious, and burns to a chalk white. In some respects it is similar to the light-blue fire clay at Empire, Ohio.

The experience of the best makers of paving brick leads them to conclude that fineness of grain is most essential to good results, but the clay must first be reduced in a dry state to an impalpable powder. Clay of the desired composition, but neither dry nor fine, may be calcined and then finely ground. This grinding is very essential in reducing the amount of heat required to vitrify it to a homogeneous mass, and the finer it is ground the stronger and harder will be the brick and the better it will stand abrasion. We quote other portions of this paper as follows:

"At Nashville, Tenn., are used creosoted or bitumenized bricks, prepared by saturating common kiln bricks of medium hardness, under a high degree of heat, with liquid pitch, obtained by distilling coal tar. These bricks have been laid about four years, on a good foundation of rolled macadam, bedded on edge in 1½ inches of sand, and rammed tight. They have been subjected to a considerable amount of traffic, and show very little if any wear. The cost was $1.80 per sq. yd. for brick and laying on finished foundation.

"At Youngstown, O., fire-brick on cement concrete base and sand with pitch in joints, cost for all $1.73 per sq. yd. Their best bricks came from Empire, O., and New Brighton, Pa.

"At Allegheny City, Pa., fire clay bricks from the West Virginia Fire Brick Co., have been laid in two layers on rammed and rolled gravel and sand, at a cost of $1.95 per sq. yd., exclusive of grading. The pavement, in use three years, is stated to be very smooth, easily cleaned, and of a handsome appearance.

"Jacksonville, Ill., has laid over three miles of pavement with Virden brick.

Some down for five years is now in good condition. One piece, of one-half mile, two layers, cost, including everything, engineer's services and all, $1.92 per sq. yd. Sand was filled into the joints in place of pitch.

"Peoria, Ill., paved two blocks in 1886, and five blocks in 1887, with Ottawa paving brick, and Chicago used the same brick three or four years ago on 63d St. car tracks.

"Galesburg, Decatur, Champaign, and Springfield, Ill., have laid more or less brick pavement within five years, the major part of which has given satisfaction. New Orleans and Wheeling, Va., Steubenville, O., Camden, N. J., and other places, have laid experimental sections. The disadvantages of brick pavements arise from lack of uniformity in the material, and the liability of incorporating in the pavement brick of too soft and porous structure, which crumbles the first winter under the action of frost. When laid on a solid foundation, the advantages are, cheapness, smoothness, cleanliness, freedom from noise, and sanitary excellence as non-absorbent. See table above. Taking all things into consideration, it is superior to macadam, wood, and, for a maximum traffic of three tons, superior to granite."

THE FIRST BRICK STREET PAVEMENT IN THE UNITED STATES.

In reply to the foregoing, Mr. J. P. Hale, of Charleston, W. Va., makes the following statements:

Mr. Ryan is certainly mistaken about Bloomington, Ill., being the first city in this country to try the experiment of brick street roadways. The writer laid, in this city, in 1870, what he believes to have been the first block of brick street pavement in America. It was considered by the knowing citizens very absurd and foolish, and predictions were freely made that it would be crushed to pieces within a week, or a month at farthest. Not a member of our City Council was willing to vote a dollar for it, and I put it down at my own expense.

After three years of constant and hard service (it being in the most trying position in the city), with no breaking or crushing, or appreciable wear, the city authorities were so far convinced of its value that they ordered another block put down, and paid for it. This was in 1873, and now, after 16 years constant use, it is in good and sound condition.

In all this time the direct wear and tear of the pavement has cost the city nothing for repairs; the only expense on it, and that has been but trifling, has been to repair places carelessly relaid after having been dug up or sewers, water mains, gas, etc.

The first experimental block of pavement, above referred to, remained in use and good condition, without repairs, for about 11 years, when the city took it up to cut down and regrade the street, in order to pave it with brick from end to end.

The city has now in use several miles of this pavement, and contracts have just been let for laying about 40,000 sq. yds. more this season. Several other cities have tried it, are satisfied, and are laying more.

A prominent gentleman and large property owner in our city, being written to by a friend in another State, for his estimate of the value of brick pavement, replied: 'Our citizens, like all others, differ as to religion, politics, tariff, social questions, etc.; but in the conviction that brick pavements are the best and cheapest in existence, they are a unit.'

The system of laying our pavement (which is covered by letters patent) is as follows: Upon the graded surface of the street, spread a layer of sand 3 inches to 4 inches, which is brought to a smooth, uniform surface by a templet drawn over it; upon this place a layer of inch boards which have been steeped in hot gas tar; upon the boards spread another layer of sand about 1½ inches, smoothed by templet, as before; then lay the brick on edge, preferably zig-zag, or, as brick masons call it "herring-bone style," after which put sand over the surface and sweep into the interstices between the brick. There are in use three methods of laying brick pavements,—1st, the method with board floor, just described; 2d, the double course of brick, on flat, and the other on edge, with necessary sand, etc., as laid in Bloomington and other Illinois towns; and 3rd, brick laid on broken stone or concrete foundation, as now done in many cities.

By either method brick makes a cheap and good pavement. The board floor plan is the cheapest and is claimed to be the best, as it gives more uniform and better bearing for the brick, and, consequently, a smoother and more durably even surface to the pavement.

Of course good brick are a *sine quo non* for a good pavement. You can no more have a good pavement from inferior brick than durable clothes from shoddy cloth.

As the selection of material, of manufacture and degree of burning necessary for a suitable paving brick are getting to be better understood, adverse prejudice is giving way, and the conviction is rapidly gaining ground in the public mind that good hard brick is the cheapest and best paving material in the world.—*Engineering News.*

Written for the Clay-Worker.

HINTS ON BRICKMAKING.

No. 40.

BY "R. BRICK."

The "settling question" seems to be as far from being settled as ever. There seems to be a difference of opinion as to what causes the settle in a burning kiln —in other words, shrinkage of bricks. Some clays settle an average of one-third of an inch for each brick in height, some one-quarter inch, some one-eighth inch, other clays shrink not at all, and in some places the bricks expand when burned—the latter occurs in burning bricks at Mississippi City, Miss., and at Slidell, La. From this it is evident that no one cause of shrinkage can be applied to all clays, for in some instances we would find the cause without effect. All will agree that it is heat that causes the shrinkage. The intense heat causes the particles of clay to fuse, this action expels the air by closing the pores, the same clay then occupies less space than before. The clays that do not shrink are of such composition that the heat we are able to make in a brick kiln is not sufficient to fuse the particles of clay, hence there is no shrinkage or settle. This is a purely practical view of this question, for when the scientists and chemists disagree, practical men must decide for themselves. When a brick burner finds by experience that his bricks must shrink one-quarter of an inch in burning to give it proper color and strength he should never close his kiln until he has a settle on this basis; if he stops with half that settle his bricks will lack both color and strength. He may have full amount of settle and fail to burn the bricks by settling too soon or too fast and shrinking the arch bricks too much and those above too little. This would not be a true settle, but an arch settle. So you can have the required settle and a poor burn, but never a good burn without the settle required, that is, the amount experience has taught him, makes the best bricks. Then comes the question of how to make a true and uniform settle. The first thing is to get the kiln thoroughly heated in every part before applying a settling heat, then settle slowly. I think a kiln set 40 to 45 bricks high should have from 60 to 72 hours to settle.

How to heat a kiln uniformly is the next question to determine. It goes without saying that the bricks must be properly set in the kiln, set so that heat can pass freely from the arches. The platting is next the best distributor of heat. There should be a double course of platting, first course of unburned bricks laid crosswise of top edge course, with ends close together and sides one inch apart. The top course should be of burned bricks, smooth and straight, laid as closely as possible. While water-smoking every fifth brick in each alternate row should be set up to make draft and remain up until the brick beneath are dry and hot, then close them down. Should a cold spot appear while water-smoking, shut the platting down over the cold spot and a few feet on either side of it clear across the kiln; in 24 hours it will be warm, then open the platting where it had been cold and it will in a few hours be as hot as the balance of the kiln, (I refer to open-top up-draft kils). Where the top is kept tight the heat is generated faster than it escapes, and as it accumulates it is forced to every part of the kiln. After the fire is well up and kiln ready to settle, keep the top tight to save heat and distribute it uniformly, from side to side and end to end. Enough heat must now escape, however, to make sufficient draft, for without draft there cannot be proper combustion, or equal distribution of heat from bottom to top. Writers may call it waste of heat, but it is a necessary waste, for a wheel cannot be turned by water power without letting it flow or waste, if we choose to call it waste. Like water we can only utilize it as it passes by, we cannot make it return again so far as the brick kiln is concerned.

AN AUTUMN WAIL.

The season colder grows apace,
The winds begin to roar:
So, when you come into this place,
Please, mister, shut the door.

It's not too warm for fles as yet,
They'd open up every pore;
But frost has come mankind to fret,
So, mister, shut the door.

Don't leave it swinging while we sneeze,
And christen you a bore;
Unless you want to see us freeze,
Why, hang it, shut the door.

Don't make us shiver till we're blue,
And hanker for your gore;
Look here, we've said all we're going to on this subject and the next thing you know we'll be over there wiping the floor with you
Unless you shut the door.

—*Washington Capital.*

Written for the Clay Worker.

HOW TO EMPTY A KILN OF BRICK.

This is an important subject, but one that has been entirely overlooked, at least I do not remember of seeing anything in the Clay-Worker touching upon it. I cannot imagine why all these brick yard writers have evaded this one item in the manufacture of bricks.

The brick itself has a very rough time of it after being dug up in the clay bank and is subjected to a great deal of rough usage until it finally rests quietly in the wall for a time.

The green brick is supposed to be a frail article; liable to become soft from wet or dampness; or if frozen while in a damp state will crumble on thawing. It will also crack in drying or burning, or become broken, shattered or marred in handling at some point between the machine and the finished brick laid in the wall.

On a great many yards, after the bricks are burned, any further care in the handling of them seems to be entirely ignored.

I could cite instances and places, where the bricks are made as good as could be expected with the machine and other appliances.

The pressed brick are all made very carefully and in fact no better made bricks can be found anywhere. But through carelessness or indifference in the matter, all attempts to retain their nice finished appearance, as taken from the kiln, seems to be abandoned. Sometimes there is a rush of orders for pressed brick and in the eagerness to fill orders promptly they are taken out of the kiln while yet warm, and the pressed brick being below part of the common stock, have to be uncovered prematurely and the rough brick are piled back on top of others and are thus in the way of everything below them. These pressed brick after being carefully made and dried, are taken from the hakes and placed one at a time on the brick barrows; each tier on the barrows is carefully brushed with a dust brush; soft blankets are used between tiers, and slats interposed between in the courses; they are set in the kiln one at a time as tenderly as if they were fine ware. But after they are burned—presto: the change is now to see how much they will stand in the way of hard knocks without breaking. They are taken up two or three or more at a time; and if they have been well burned they may be adhering to the faces just enough to cause them to stick together; a blow with another brick will bring them apart, or make bats of them. They are piled together in heaps, or layers, on tray barrows and wheeled over uneven runways to the cars or wagons; and by the time they are delivered at their destination they are full of scratches and mars, and corners knocked off they look as if they had been left over from the Tower of Babel. That is how not to unload a kiln of bricks. It is a poor advertisement to any company, and a standing disgrace to the man who makes or burns a good article, as his work has gone by default, and the brick ruined in its appearance by careless handling.

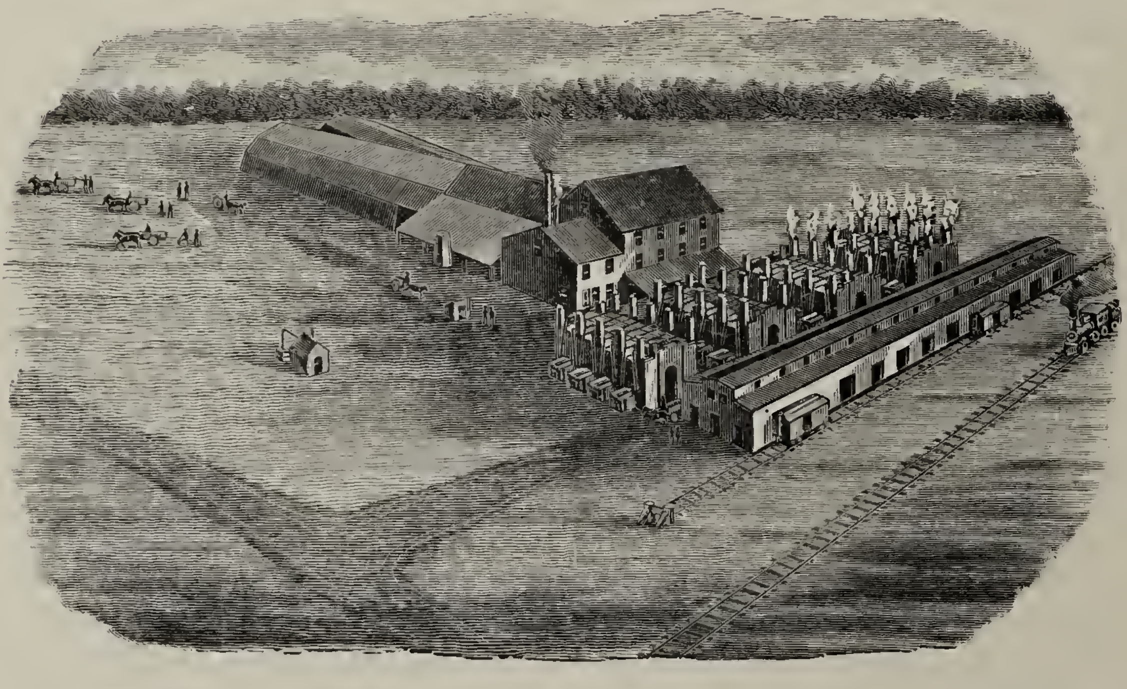
All bricks should be handled with care enough to insure good faces on at least one-fifth of all the common stock. The pressed bricks are supposed to each have one face and that should be kept free from all defects, all the time till it is laid in the wall; and even then the mason should use every precaution to keep them from being stained while the building is in progress. On opening a kiln, let the platting be taken up carefully and set back on top of the clamp walls, and all salmon brick or light courses on top be taken down first so as to get at hard brick below. In unloading clamp kilns begin at each end and strip all down to the top of pressed brick courses. Then take out all the pressed brick and do not mix them with common brick, beginning at the front at each end of the kiln, so as to get all clear to that level. Use every precaution to keep the faces of the bricks clean and free of mars of all kinds. A kiln of bricks will unload easier beginning at the end where you left off setting and go back in reverse order, taking out first those set in the kiln last; time can be gained in this way. Try it.

Then when your pressed brick are all out, unload to top of benches, including the overhangers, and let all bats and rubbish fall into the arches out of the way, square up the work on this level to the walls on both sides. Then take out the benches and the rubbish as you come to it, an arch at a time, and your floor is cleared. Much time is gained in this way, your work is orderly, and the brick can be graded as loaded, while in the former case of digging holes to get at the pressed brick much time is lost or wasted, and many bricks are spoiled or broken; and on works where a continuous stream of bricks are expected, it is just as important to unload quickly, as it is to set the brick in the kiln quickly. BRIX.

BRICK YARD SKETCHES.

Probably no state in the Union possesses so many advantages for the manufacture of brick as Ohio. Situated near the center of population, midway between the largest cities of the continent, with clays suitable for the manufacture of all grades of fire and building brick abundantly and widely distributed, and an apparently unlimited supply of the best and cheapest fuel—coal, petroleum and natural gas—that state comes as near being the paradise of the brickmaker as the most enthusiastic devotee of the art could hope for.

In consequence this industry is being developed there to an extent of which many of our readers have no adequate idea. Especially is this true of the natural gas region of the state, where brick yards are becoming a prominent feature, not distinguished, as brick yards generally are, by a volume of black smoke; for, save the steam, the atmosphere is as clear as if there were no fires about the place.



THE CENTRAL PRESSED BRICK CO'S WORKS, NORTH BALTIMORE, OHIO.

One of the best equipped of these plants is situated at North Baltimore, on the B. & O. R. R., about one mile from its junction with the T. C. & S. The works are owned by Cleveland capitalists in the name of the Central Pressed Brick Co., the president of which is P. D. Briggs, of the Standard Oil Co., and the secretary, F. N. Carter, editor of the *Western Machinist*. The construction and starting of the works was superintended by W. D. Richardson, who is still connected with the company.

The process employed is that known as the dry press process and the manipulation, briefly described is as follows:

The soil to the depth of about a foot is taken from a large area leaving exposed a level bed of clay. This bed is then cut to the depth of three or four inches and thrown up in a pulverized condition, by a large disc harrow. When sufficiently dry it is put into windrows by a road scraper that it may be taken into the storing sheds by excavating carts and dump carts. A portable railway operated by a hoisting drum run from countershaft, is used to draw the clay in cars from the clay sheds to the machine house where it is dumped into a large hopper, in the bottom of which, or an incline, is a strong spiral conveyor which breaks up the large lumps, if any, and feeds the clay regularly and constantly into a Stedman pulverizer, from which it is elevated about 35 feet and dumped upon an incline screen 16 feet long. The clay that has passed through this screen, of perforated steel, holes three millimeters in diameter, drops into a large hopper from which it feeds automatically into the press below. The press is Simpson's latest improved four-mold machine, which produces a solid brick with perfect edges and a smooth, polished face. From the press the brick, save the ornamentals which go to the dry house, are taken directly to the kiln. The kilns, which are being built as rapidly as possible, are the Eudaly down-draft. The fuel is natural gas from a well about 300 feet from the works. The pressure of the gas is reduced by a high pressure regulator, from about 300 pounds to the square inch to 25 pounds, and thence passes into the low pressure regulator whence it issues for use in kilns and under boiler at a pressure of six to eight ounces.

With no smoke nor ashes, no firemen to neglect their duty, and a heat that cannot vary except at the will of the man in charge, the burning of brick is a much simpler and surer operation. Verily the natural gas region is a wonderful revelation to an outsider and it is not without some feelings of envy and discontent that he returns home to his wood and coal.

THE WHITTAKER PRESSED BRICK CO., OF QUINCY, ILL.,

Is located a couple of miles from that thriving little city and is running to its full capacity. We enjoyed a pleasant drive in company with the genial manager, Mr. F. Brown, who, though not professing to know all about brickmaking, is a good, well-tempered business man, and will pilot the concern to success and prosperity, we are sure. The works are located on the Wabash R. R. and are making 15,000 a day by the semi-dry process on a two-mold Whittaker press.

The plant is one of the most compact and conveniently arranged we have seen. The clay is gathered and stored under sheds in the manner common to this process, from which it is wheeled to a platform in barrows and dumped into or near a Stedman pulverizer, which grinds or reduces it very fine. It is then carried by elevator buckets to a chute above the machine, from which it is dropped or fed into the machine. From the machine they go direct to the kilns excepting a few ornamentals which have to be dried some to prevent checking. When taken from the machine the brick are hard and strong enough to be handled easily without danger of marring.

They have four square up-draft kilns with permanent walls, etc., of 200,000 capacity each. They set three on three and five on five or five on two, forty high.

At the time of our visit they were just opening a kiln which seemed all that could be desired. The brick were good and hard up to within the second row below the platting and even that was a good salmon. They use coal, which costs them $3.25 a ton. Their common brick are now selling for $6 to $6.50 delivered.

A large proportion of their brick are excellent face brick and they also make a goodly number of shape and ornamentals.

The new City Hall building now in course of construction is their latest contract and will prove a monument to their credit. The first and second stories were nearly completed. The brick are a rich, dark red and being laid in white mortar with very thin joints presents a handsome appearance.

AT GALESBURGH, ILL.,

We find the Galesburgh Pressed Brick Co. and the Galesburgh Brick & Terra Cotta Co. both running to their full capacity and entirely on paving brick. They were each making about 30,000 a day on a Frey-Sheckler Acme machine. The clay is taken from the bank hard and dry, much of it seeming to be as firm as stone, and crushed in a dry pan which reduces it to powder. It is then conveyed to a pug mill above the machine in elevator buckets, where sufficient water is added and it passes into the machine. The brick are dried on a hot floor from which they are trucked to the kilns. The latter are Eudaly's patent square down-draft and are spoken of very highly by the superintendent of both yards. The green brick measure 8¾x4¼x2½ and when burned are 7⅞x3¾x2¼, are very heavy, hard and tough, qualities that combined make an ideal paving material. We examined the pavements laid and found them smooth, firm and free from ruts.

The first block of brick pavement was laid in 1883 and is now apparently as good as when put down. No other pavement is considered there now. They are putting down brick as fast as the city treasury will justify.

The best results have been obtained by first laying a bed of macadam and then a layer of sand on which a course of brick laid on the flat then another layer of sand one inch in depth and then the second course of brick laid on edge, over which a small sifting of sand is swept.

The macadam, while it makes the best foundation, is not considered indispensable, a large portion of their pavement being laid without it. Pavers bring $9.50 delivered and the pavement costs about $1.42 a square yard complete including stone curbing.

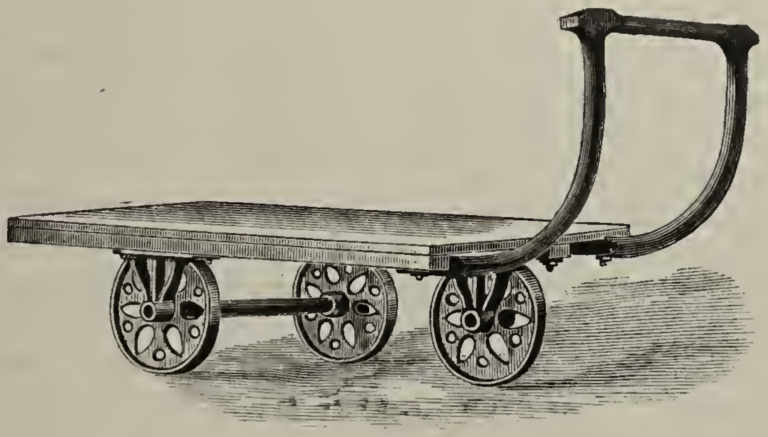
WELLINGTON, OHIO,

Is a familiar name to very many of our readers for it is here that the Quaker Brick Machines are made and sent out to the craft upon their labor saving mission. At the works of Bennett Bros. & Co. we find the good work going on quietly but industriously. The past season has been a satisfactory one to them. The demand for the "Quaker" continues to increase with each year and now they are actively at work on a new all-iron "Quaker" that will be offered to the trade the coming season and will, they feel sure, add still greater honor to the name which is already so favorably known to the craft the country over.

In company with one of the firm we visited the brick and tile yard of Mr. C. V. Hemenway which we found running under the supervision of the proprietor who has had an extended experience. The yard has some original and admirable features.

The brick machine is run by a traction engine; both standing on a track extending across one end of the yard and beside which is a soak pit three hundred feet long, eight feet wide and three feet deep. The clay, which is very stubborn and hard to work, is carted and dumped in this pit and allowed to soak for a day or two when it is shoveled directly into the machine, which, with the engine, is moved back and forward as the pit is emptied. Water is drawn from a large tank erected above the center of the pit. The water is pumped into it from a well at one end of the pit, by the traction engine, which also furnishes power for the tile mill. From the machine the brick are placed on pallets and trucked to the racks which are among the best we have seen. They are made of 2"x4" pieces 6 feet long, set on end, 1¼ strips two feet long are set into the upright pieces and on these the pallets are laid lengthwise with the racks, one row on each side of the upright pieces. The pallets hold their shape very well and are easily handled without the least danger of crushing or marring the brick. Mr. Hemenway has used this system for six years and likes it very much. He makes 25,000 brick a day and could make more but the demand doesn't justify it. He has three square open-top kilns with permanent walls, holding 200,000 each, in which he also burns his drain tile. About ten courses of brick are first set in the kiln and then tile are placed on these till the kiln is filled and the tile covered with a platting of salmon brick. Slack coal which costs $1.05 a ton is used and judging from the tile and brick on the yard the results are quite satisfactory. The tile are made on an Ohio Tile Machine, manufactured by Fate & Freese, of Plymouth, O. In reply to the query "How do you like the 'Ohio' Machine," Mr. Hemenway said: "I have used it for three years without the least trouble. It has cost me nothing, virtually, for repairs and I want no better tile mill." The tile factory is a one story building 50x150 feet. The floor is raised about three feet from the ground and made of 2"x2" strips laid an inch apart. The tile are set two deep and dry rapidly without cracking. They are taken to the kilns on a truck of Mr. Hemenway's own invention and which we illustrate. They are so serviceable that Messrs. Bennett Bros. & Co. have added them to their line of brick and tile supplies.

To Mr. Hemenway belongs the honor of inventing the original horse-power Quaker Brick Machine. The first machine was made twelve years ago and from it the manufacturers have evolved the improved "Quaker" of to-day.



THE INDIANA TILE AND DRAINAGE ASSOCIATION.

The next annual meeting of the Indiana Tile and Drainage Association will be held in this city commencing the first Tuesday in December next. This is one week earlier than the usual time. The executive committee have thought it wise to make this change for the reason that the annual meeting of the National Brick Manufacturers' Association will occur the week following, and very many wish to attend both meetings. So far as we know the holding of the annual meeting of the Indiana Tile and Drainage Association on the first Tuesday in December will not inconvenience any one, and the change of time will, we think, meet the approval of all.

Further arrangements for the meeting will appear in the following number of this journal. Don't forget the dates, Tuesday, Wednesday, December 3d and 4th. Come yourself and bring a neighbor with you.

There will be peace
Without surcease
For suffering bald heads by and by;
For frost will seize
And quietly freeze
The frisky, festive, fiendish fly.

—*Washington Post.*

CORRESPONDENCE.

These columns are open to all. The full name and address is required but will not be published except when permission is given by correspondent. Those desiring to communicate privately with any correspondent whose full name is not given can do so by addressing letters care of Clay-Worker.

From Our English Correspondent.

Editor Clay-Worker:

As promised in my last letter, I will endeavor to explain from a brickmaker's point of view, why the manufacture of semi-dry pressed bricks is better for his breeches pocket than the plastic, wire-cut or any other description of bricks that require manufacturing in a wet state:

1. Semi-dry pressed bricks can be, and are, made every working day in the year, unless the weather is exceptionally bad. Bricks made plastic, or in a wet state, can only be made during spring, summer and autumn, unless expensive drying sheds are used.

2. Semi-dry pressed bricks can be, and are, made every working day in the year from the raw material taken direct from the bank without any previous preparation whatever, and directly they leave the machinery, are stacked in the kiln ready for steaming and burning, and are not again handled until they are ready to load into railway trucks or carts. Bricks made plastic or wet—the clay should be got in the winter, watered and tempered, and be in heaps until the weather permits it being made up, the money spent in getting and tempering the clay has to lie idle several months after the bricks leave the machinery they have to be hacked under sheds or covers, or dried in a drier. In short, the brickmaker has first to put the water in the clap, make it up into bricks and then dry it out again before the bricks can be stacked in the kiln all of which means dipping his hand into his breeches pocket.

3d. Semi-dry pressed bricks can be manufactured and on railway tracks in 14 days and this enables an order to be executed promptly. Plastic or hand-bricks require about 30 days to manufacture, consequently the money can be turned over twice as often with semi-dry bricks as with plastics.

4. Semi-dry pressed bricks can be, and are, stacked in the kiln directly they leave the machinery and are independent of the weather, neither clay houses for the clay, or driers for the bricks being required. Plastic and hand-made bricks require drying before being set in the kiln, and they are at the mercy of bad weather if they are dried in a drier or on hot floors. In many cases, the ends come off and the bricks are shaky.

5. Semi-dry pressed bricks.—In the manufacture of these, the brickmaker is in a great measure, independent of skilled labor, the machinery doing most of the skilled work. Any pick and shovel man met in the street can get and load the raw material into trucks or barrows and wheel some dry bricks on crowding barrows into the kiln, the only skilled man wanted is the burner and as the bricks should be set in the kiln to suit him, he is quite able to instruct any intelligent brickyard laborer to set a continuous kiln in a few hours for although the burner's work on a continuous kiln is the most responsible, it is the lightest in the brickyard. Plastic wire-cuts or hand-made bricks require men brought up from their youth in a brickyard and to wheel green bricks directly they leave the cutting table on a cockney barrow is simply a "work of art" and in wheeling and handling the wet clay and wet bricks the water has to be wheeled and handled just as much as the clay.

6. In case of a stagnation in trade and the bricks not selling freely the prime cost of say, two million semi-dry pressed bricks stacked in the yard would be very little more than half of the cost of the same number of plastic wire-cuts, or hand-made bricks.

7. During the winter months, the rent, rates, taxes, clerk's wages and other fixed expenses are going on in plastic and hand-made yards when no bricks are being made, just the same as when the yard is in full work. This is different in a semi-dry pressed yard, as bricks are being made all the year round.

8. In plastic and hand-made yards, during the winter months, the burners and setters have to be paid or work found for them or they would leave, whereas these men are employed in semi-dry yards all the year round and are contented.

9. In a semi-dry pressed yard the the spring demand for bricks (when good prices are realized) can always be supplied, whereas in a plastic or hand-made yard, the bricks are generally gone before the spring arrives and there are no bricks to sell until they are made.

10. In a semi-dry yard, but little stock need be kept as the bricks are made the winter through but in a plastic or hand-yard, the bricks must be stored up in summer to supply the winter demands.

The machinery first used for manufacturing the Petersboro semi-dry pressed bricks came from various English makers and required presses independent of the perforated pan and machines, also the cylinders and presses lubricating with creosote oil, but about two years since, a Petersboro brickmaker who had hitherto made nothing but plastic wire-cuts, to save his yard being shut up by the semi-dry brickmakers, introduced in this district two new machines to make semi-dry bricks, viz., the same machine as advertised in the Clay-Worker by McCoy, Ives & Co., Quincy, Ills., with that excessive modesty for which *all* Americans are so justly celebrated, as "The Best on Earth," "Whittaker's Celebrated Semi-dry Brick Machine."

Well, Mr. Editor, I won't find fault with their advertisement, for there is good foundation for what they say, but their ——— is certainly worthy of admiration. Whittaker's Machine had been in work but little time before we all saw the machinery previously in use must take a back seat and at the present moment one of the best Petersboro pressed brickyards are taking out their semi-dry machinery and substituting two of Whittaker's, and so far as appearances go, this must be done (sooner or later) in the other yards. The reasons are, first, Whittaker's does away with two boys lifting brick from machines to presses, the youth feeding hopper above machine with ground knots, also the brick (creosote) oil for cylinders and presses, Whittaker's being lubricated with steam from the boiler, and in addition to this, turned out bricks with square corners, good edges, good shape, hard, sound and second to none.

Now, Mr. Editor, I do not wish to persuade every brickmaker that he can make semi-dry pressed bricks, because it would simply be an impossibility. The first absolute necessity is that he should have a clay or shale that will grind through a perforated bottom pan. I am no advocate for disintegrators for semi-dry brickmaking. In my opinion, this is the rock that has tripped up many a semi-dry brick maker. The disintegrator provides a crushing vertical motion. A perforated bottom pan gives a grinding, horizontal motion, grinding the clay or shale into small pieces that would pass through a riddle ⅛ to ¼ of an inch mesh and this is necessary for the semi-dry press. I have seen disintegrators choked with semi-dry clay or shale, which ground easily in a perforated bottom pan.

Some time ago, a brick manufacturer who had been accustomed to our Peterboro semi-dry brickmaking, opened a large brickyard where there was a deep bed of gault of superior quality suitable for making plastic, wire cut, cream colored bricks. After he had got his yard into work in an evil moment he thought he could make this gault into semi-dry bricks by the same process in use near Peterboro. He obtained the same machinery and presses used here and made a start. After he was totally unable to get the gault through the pan bottom, the idea occurred to him to build an enormous steam drier, using the waste steam from his 80 h.p. horizontal engine and on this floor dry the gault before putting it in the perforated bottom pan. He partially succeeded, but the cost of dumping the clay on the floor, picking it up again and other contingent expenses, made the cost of the finished brick more than he could make them plastic. Afterwards, he purchased a disintegrator, and he found the gault went through fairly well but as for getting it through the semi-dry machinery afterwards it was out of the question and the last time I was in the yard the semi-dry machinery after being altered time after time trying to work the gault, was pulled out and sold for little more than old iron

As I have endeavored to explain my views as to the expedience of brickmakers manufacturing semi-dry bricks *when they have suitable clay or shale*, I will in future numbers of the Clay.Worker, (with your permission) publish a complete set of detail drawings of the continuous kiln in use here burning the semi-dry bricks so that any brick manufacturer can build one without further instructions, and also give full detailed particulars how to burn the bricks in same so that any intelligent brick burner can take charge of one of these kilns.

R. S. Bluck.

Petersboro, Eng.

How Can We Get the Right Color.

Editor Clay-Worker:

I would like some practical red brick burner to give me advice through your paper. The clay on this yard is a blue, river clay; it is mixed with about one-third fine sand and works well with a machine. The brick do not shrink much; I set them 40 high and burn with coal. The bottom of the arch is three brick wide. I make the straight courses 8 high and close with 5 brick. Each third course is tight; the first overhanger we make tight and the fourth and second, third and fifth, we make as loose as they will bear. The sixth brick, or the binder, is set straight on top of the overhangers. The two bottom courses of the middle brick are set loose, and 6 packed tight. The skentling I put in as loose as it will stand, so the fire can get out of the arches. On top of the arch we set the brick 3 on 3 and put fine coal in about three times—the first about 10 courses above the arch, then 7 courses higher, and then on top. We put on raw plating about two inches apart; as the fire comes up put on burnt plating. When we set fire we dare not get it through in less than thirty hours; if we do, the heads of all the brick in the arch fall off. We can get the kiln hard up to the second standing course. All the brick fourteen courses above the arch are beautiful red and the rest are pale red. We did try to give more fire but then we spoiled the arch.

How can we get the desired color? Please give me advice through the Clay-Worker.

A. J. Kautz, Jr.

Newport, Pa.

Adobe Houses in Louisiana.

Editor Clay-Worker:

No doubt many of your readers would like to read something of how the early French and Spanish constructed their residences in the long past. I send you a clipping from the *Sugar-Bowl* written by Col. F. D. Richardson. You will find the article interesting. The Colonel is an old settler on the Teche (pronounced Tash.) Since coming to this land I have visited and examined many of these unique adobe houses, some of them fifty or more years old and to all appearance as good and sound to-day as when first constructed. To the visitor these adobe buildings present a strange and striking appearance not soon forgotten. To this day in some of the southwest parishes, now and then, an adobe house is built. They are comfortable and pleasant to dwell in. You can not tell a man in this country every time by the house he lives in. Many of these people are worth thousands of dollars, have plenty and are well to do. But gradually wood and brick is taking the place of the ancient moss adobe structures. St. Martinsville, that Col. Richardson mentions is to-day a fine, gay old town on the loved Teche—the P'Tre Paris, of Louisiana.

W.

Haasville, La.

OLD MEMORIES.

Almost the universal style of buildings everywhere here were adobe, not of unburned brick, as is often supposed, but a mixture of clay and moss. This, to all prairie countries, was what the historic loghouse was to all woodlands of the United States, an architectural necessity. They were erected very much on the house raising plan, so familiar to our fathers, by joint labor. When a church like the first one at St. Martinsville, had to be built, it was made the great event of all the country round about, and was, no doubt, attended with all due rites and ceremonies. But in the construction of the ordinary family residence of two rooms, with chimney of the same material in the middle, it was about as follows, as we have often seen it done: Friends and neighbors were invited in sufficient number with ample refreshments made and provided. A place was selected convenient to the building with loamy soil suitable for brick, and a hole was dug of sufficient size for the quantity of material required. This, after deep spading was watered to the consistency of brick mortar. Then green moss, of which a sufficient pile had been provided, forehand was spread like a gray blanket over the mortar bed when a certain number of men, barefooted, with trousers rolled up above their knees, tramped the circle, crushing in the moss to the bottom of the loose earth. Then came another layer of moss and another tramping and so repeated till the pit was full to the top of adobe—moss and clay. This material was then pulled out by blankets or sections as it was tramped in and taken to the building already completed except the walls or weather boarding for which this mixture was the substitute. In sections of country where there was no Spanish moss, prairie grass or hay was used as a poor substitute. Beginning at the sill they went up, firmly, driving sticks nearly horizontal between the studding about every six inches, to hold the mortar to its place, and when finished, these sticks were in the center of the wall. This, when half dry, was shaved off with a sharp spade and left to dry and when well white washed made a solid and pretty wall, cool in summer and warm in winter. This was one of their orders of architecture, but there was still a "lower deep" in which there was no floor or sills, the ground mortised and round holes used for studding with the adobe applied in the same way. For flooring, they had good, well pulverized clay with a top dressing of ashes, well beaten in, which two or three Cajan balls would make as hard and smooth as a sanded floor. Split boards or thatch was often used for covering and gables, all attesting human ingenuity before the time of saw mills and such business.

Their modes of conveyance were about as primitive as their style of building. The family cart, celeche, (pronounced callash) was a vehicle made entirely of wood and rawhide, which supported the body box over the axle-tree. In fancy, we could see the sad, anxious face of Evangeline, peering out in every direction for her lost and loved Gabirel. A very serious accident happened to one of these vehicles at a tavern near us in the 30's. An old couple from Pare Perdu put up for the night on their way down the Teche and their celleche and gear was left in the yard. Next morning the box was on the ground—hungry dogs had devoured all the springs and the traces.

Progressive Brickmaking in New England.

Editor Clay-Worker:

To any one accustomed to the old, cumbersome method of manufacture prevailing among the New England brickmakers, for there has been no important improvements either in the process or the product for many years, a visit to the works of the Barrington Brick Company at Barrington Center, R. I., will be an agreeable surprise.

Six months ago the site of the works an unsightly swamp covered with scraggy trees and underbrush and the idea of a successful business ever being established there was considered absurd, but as subsequent events have proved, the promoters of this enterprise knew their business.

Mr. W. K. Logee, the principal in this new company was too shrewd a business man to go into so large an enterprise blindly. It was not until he was satisfied from carefully conducted experiments that he put his plans into shape and formed the present company.

Mr. Logee secured the services of Mr. Alfred Morgan, a gentleman of large experience in brickmaking both in this country and in England his native land, to whom was entrusted wholly the erection and equipment of this splendid plant and the result proves that the trust was not misplaced.

The clay is taken direct from the pit in a car with a capacity of ten to twelve barrow loads and drawn by cable driven from the line shaft up an inclined track to an upper floor in the main building where it is dumped into an open mixer, of a new design; when it is properly tempered and from which it passes by gravity into the brickmaking machine upon the ground floor without elevators or travelers (commonly used in other yards) or manual labor.

The machinery throughout is certainly of novel construction and performs its work marvelously. It must be seen to be appreciated. It was constructed by Messrs. Frey-Sheckler Co., of Bucyrus, Ohio, from designs furnished by the Superintendent, Mr. Morgan.

The brickmaking part is an improvement upon the Acme Machine made by this company. The idea was to have a machine of double the capacity of the above and this machine which is called a duplex Acme for that purpose according to specification furnished by the Superintendent. It is in some respects similar to the old Acme but that it has a double delivery upon one shaft with triple gearing driven by a 12-inch belt. In conjunction therewith is a double steampower press also the design of this same superintendent. It is (as we were informed), the outcome of many years of careful study and practical familiarity with other presses in use for the same purpose. It is indeed, a splendid machine; it is admired by every practical man who has seen it and watched its operation. Its chief characteristics are strength and simplicity, always the most desirable features about brick machinery. The brick are taken from the D Acme and passed through this press and then placed upon cars holding 500 bricks each car and then carried into tunnel dryer heated by steam which are giving good satisfaction. They are then passed on to the kilns.

At present they are burning in the old way. The first kiln was burnt while we were there and for color and soundness, the bricks were far superior to any we had seen in New England, fully equal to the Philadelphia pressed bricks, and this is the more remarkable from the fact that this result obtained from the clay in its natural state. They are enabled to obtain any grade of color from a deep cherry red to a dark brown, leading one to suppose that there were some additions in coloring matter used, but Mr. Morgan assured us that such was not the case. The impressions with regard to these are strengthened when compared with the product of an adjoining yard which has been in operation thirty years or more, manufacturing from precisely the same clay but in the old way. They have not the same color and the brick itself is far inferior in quality. One is inclined to the opinion that there may be some peculiar or secret method of burning which the superintendent and his men are not disposed to reveal.

They are making preparations to erect a series of permanent kilns upon the semi-continuous principle and from the plans shown us by the superintendent they will no doubt be of very great advantage, and place them in every respect independent of wind and weather. They purpose running the works the year round which will be another great advantage to the concern by enabling them to secure a better class of help and better prices for early spring contracts, and to the town as well, inasmuch as it will induce permanent residents; a different policy having been pursued by the adjoining establishment which has imported its help every year from Canada, an element of no benefit to the township either morally or financially. This new departure of this Barrington Company if continued, must further conduce to the profits of the stockholders having a superior class of workmen as indicated already in the superior quality of the bricks must command higher prices and the range is so great that any demand may be supplied.

A superior quality of vitrified brick can be made from this clay, a sample of which was shown us which goes to show the impression false which obtains among western men, viz., that good vitrified bricks cannot be made in New England.

One of the pleasing features about this place was the seeming intelligence characterizing the actions of the majority of the men. Every man appears to have his place and to fill it. There was none of that hustling and driving which invariably takes the place of work. Everything seemed to be automatic from the first shovelfull of clay to the loading of of the bricks upon the railroad cars ready for shipment Although the employes were of several different nationalities, perfect harmony prevails.

Loafers, drunkards or vicious men are not tolerated as Mr. Morgan has no use for such people. He is, himself, an Englishman by birth, but an enthusiastic American by naturalization and inclination and appears very proud of his adopted country.

The success of the Company has been phenomenal but not undeserved for they have invested their capital in one of the best plants in the United States, with a capacity of sixty to seventy thousand bricks per day with contracts away up in the millions and such is the demand that they are already planning to duplicate their present plant.

Warren, R. I. A. E. Covel.

Paving Brick.

Editor Clay-Worker:

No doubt a very large number of your readers are now, more or less, interested in the subject of street paving brick. I think I have written something on this subject before for your columns, and I have recently seen from the pen of others some very valuable suggestions on the subject of street paving brick.

If you will allow me, however, I desire to state briefly some of the things I have found to be necessary for the production of first-class street paving brick. Of course the first thing to be mentioned, is the kind of clay to be used. There is a general impression among city councilmen and city engineers, and in fact among a large number of the manufacturers, that in order to produce a first-class paving brick you must have fire clay, this is a mistaken idea. Every one well knows that the better the grade of fire brick the less the bond when burned; and every one well knows that the better the paving brick the greater the bond when burned.

Again, for a superior paving brick you must have a clay that will stand a very high heat for a long time without melting; from this fact I think has grown the impression that paving brick must necessarily be made from fire clay. And for the same reason many persons who have clays that make excellent street paving brick, because of their standing a very high degree of heat in burning, imagine they have fire clay.

It is not an unusual thing for me to receive specimens of such clays, to be tested or examined for their fire clay qualities, when in fact they do not resemble a fire clay in scarcely any particular. It is not my purpose in this article to give an analysis of the various kinds of clays, or to show the chemical constituents of fire clay, paving brick clay, etc., but I desire simply to make a few plain, practical suggestions in reference to the paving brick clays as compared with other clays, as well as some of the practical ways of testing them. With the novice in the business he may have some idea of what kind of clay he has as he takes it from the bank, but he should, at least, be placed in possession of the practical ways of testing it, in some more definite manner than merely a casual examination. Of course the most thorough test that can be given any clay for paving brick purposes, or for any other kind of ware, is to burn it. This suggestion is not new by any manner of means, and has been followed repeatedly, with very satisfactory results, yet in many instances, it has proven very unsatisfactory. To illustrate: Many persons imagine they have a fine bed of clay for street paving brick, sewer pipe, etc., and having heard that to burn clay is the most practical way of testing its qualities, they procure a small portion from the bank, more than likely in a dry state, and place it in a grate fire of wood or coal; or, as is more often done, go to the nearest blacksmith's forge, and there make, what is thought to be, a thorough test, by heating the clay suddenly to a temperature great enough to melt cast iron, in fact I have often known of the iron being placed in the forge with the clay for the purpose of making the test.

It does seem to me, that any one, on second thought, would readily realize that this is practically no test at all, for the reason that there are always particles of iron in the forge which unite with the clay, and if the clay itself does not contain sufficient iron to make it thoroughly vitrified it would take up enough in the forge to give it this quality. The same is also true in testing clays in coal stoves, or grates. Often the clay is suddenly heated to a degree sufficient to destroy all its plastic qualities in one part before the water that is mechanically united with it, is driven off from other parts.

I have had pieces of clay sent to me that had been burned in this way, which when broken, showed all shades of color, from black or dark gray to a bright red. Clays to be tested well, must be *gradually* brought to that degree of heat necessary to burn the ware, as the term is understood by the brickmaker.

Many others desiring to make a more thorough test, carefully pack a few pounds of clay and send it to some brick manufacturer who very kindly makes two or three bricks, as the case may be, by carefully pulverizing and pressing, and perhaps repressing, after he has formed the brick to suit his fancy, it is set away in some dry place, where it remains for days, or perhaps weeks, until he has a kiln set and almost ready to fire, then these bricks now thoroughly dried, are placed in the kiln for burning; now all the brick in the kiln are seldom, if ever, as thoroughly dried or as well made, as the ones set in to be tested.

Again the clay in the brick to be tested is not, in all probability, anything like the clay from which the main kiln is made, consequently, you have in the same kiln to be burned a large body of brick made from one kind of clay, a part of which may be well dried, or more than likely a large per cent. of them are not thoroughly dried, and in the same kiln you have a small number of brick, made from and entirely different kind of clay, thoroughly dried. Now in watersmoking the kiln, the water driven out of the kiln proper will necessarily penetrate the brick that are set in to be tested, and will produce in them the same degree of moisture as the other brick, this very often cracks the brick to be tested, or produces what is known as watersmoke or whitening of the surface, however, this is not the most serious objection to testing brick in this way.

The few brick that you have placed in the kiln to be burned being thoroughly dry and made from a different clay from that in the body of the kiln will not burn the same with the same temperature and time, and the brickmaker cannot, of course, hazard the entire kiln of brick in order to get out a few samples, consequently he burns the kiln with reference, not to the samples, but to the kiln. If the samples come out good then the clay is said to be good, if they come out poor you will have as much doubt as to the quality of your clay as if you had not made the test at all.

I once knew a terra cotta maker who desired to test some terra cotta clays which he thought would burn a very clear white and which he afterwards found to be the case, but in his tests he placed the samples made from this clay in the same kiln with ware made from red clays, and to his surprise upon opening the kiln he found his samples made from white clay to have a strong pinkish ting, which was caused from the iron in the red clays being taken up by the white clay in burning. While I have mentioned some of the difficulties and dangers liable to arise in testing clays in this way, I do not wish to be understood as condemning the system for it is often the only available method the brickmaker has. I simply desire to guard against some of the errors that might arise.

I have found that the clays that give the most satisfactory paving brick have very little sand, or surface clay in them.

They are generally found deep in the ground and are known as shale or soapstone clays. I have seen, however, some very excellent paving brick clays found in a plastic form in the bank.

The tempering of clays, is perhaps, one of the most important things to be considered in connection with manufacturing good, first-class, paving brick. Clays that make good paving brick are usually very hard to grind and temper.

If the clay is of a plastic nature it is generally tough and waxy in appearance and feeling, and will not easily take water in tempering, and if ground before drying, usually passes through the crusher, or rollers, in flakes; which are not easily broken in the pug mill or machine, and are often found in the brick untempered.

If the clay is in the form of a soapstone or shale, they must necessarily be passed through dry pans or other heavy crushers, and thoroughly pulverized before tempering in the pug mill or machine.

I have often heard it stated that clays could be tempered too much, this I believe to be true of many clays used for making common brick; but I have yet to see a clay suitable for making paving brick that could be tempered too much.

When the clay is well tempered the particles unite more closely, the brick is less porous, and consequently when burned is much stronger, and the brick when broken presents a smooth glossy fracture.

The shape and size of paving brick are also very important things to be considered. For building brick, sewer work, etc., it is desirable to have a brick with good sharp corners, but for street paving brick the corners should be round.

The brick is much stronger and will stand wear in the street much better, for the reason that the sharp corners are easily broken off, and of course do not break from each brick exactly in the same proportion and therefore the street will soon present an uneven and rough appearance. As to size, I think many city engineers are making a great mistake by requiring the brick to be made extra large. Some even go so far as to advocate large square blocks. This kind of a brick is hard to manufacture, hard to dry and very difficult to burn. They will not dry or burn evenly and therefore do not make a proportionately strong brick.

Again I have found many manufacturers making the brick in width and thickness the usual size of a common brick, but at least one-third longer, this I think to be the greatest error that I have observed in the size of brick. It is difficult to bed a brick in sand or on concrete, so as to prevent its breaking when the length is out of proportion to the width and thickness. I believe that the best size brick for street paving is about 2½x4¼x8½ inches.

For the manufacturer this is undoubtedly the best brick to make for the reason that he always has a brick salable as a common building brick. In building plants for manufacturing paving brick, or indeed for the manufacture of any kind of clay wares, I think they should be constructed with a view of running the entire year.

The reason is apparent to the manufacturer. The money invested in building the plant, would, if loaned, bring an interest for every month in the year, and should, when invested in the manufacture of brick, do the same, besides a plant run the greater portion of the year is generally kept in a much better condition, and the manufacturer is much more likely to have a good stock of brick on hand early in the season when brick bring better prices than later in the season, this, however, applies more particularly to the manufacturer of common brick.

Before closing this article allow me to mention briefly some of the streets of Cincinnati, made with granite blocks. I find in several parts of Fourth Street, that the granite pavement is now being torn up, and that new blocks are being put down in place of the old ones. The old blocks do not seem to be worn out, in fact, they seem, to a casual observer, to be in a fair condition, but on investigating the matter carefully, I learned that the street had become very dangerous, for the reason that the corners of the granite blocks have worn off leaving the top of the block very oval and smooth, and it was said that horses passing over the street, were constantly falling.

The old blocks are being replaced with new ones of much softer granite. When the street was first laid, any block that had indications of being soft, was rejected; now the blocks that have indications of being hard are rejected; the reasons given are that the soft blocks wear down more uniformly, and do not have a rough surface; further, that the horses' hoofs adhere better to the soft blocks than they do to the harder ones. This I find to be one of the best arguments in favor of brick for street paving, that I have ever heard. I feel confident, that if the contractors and manufacturers of street paving brick will see to it that nothing but the very best brick, made properly from the best of clays, and well burned, are used in the streets, that it will not be long, until brick will come into general use. In fact many cities are now preferring them to either granite, asphalt or the cedar blocks. W. A. EUDALY.

Cincinnati, O.

Machine vs. Hand Yards.

Editor Clay-Worker:

If you will grant us a small space in your columns we will endeavor to reply to the Village Brickmaker's communication in the September Clay-Worker.

I am a very poor writer but will try to answer a few of his questions. The reason why "Mr. V." perhaps sells so cheap is that he is about "busted" and must do the best he can or perhaps he wanted to get money to buy a machine. Hand yards out here are getting few and scattering for the hand-made brick can never come up to the stiff mud wire cut machine brick. That we know by experience for we run a hand yard for years and when we shipped the brick 20 or 30 miles from home they were all broken, but now we ship brick 300 or 400 miles, with but little breakage. If we had hung on to the old hand method, under the shadow of the machine yards about us, and that is why I intimated that may be "Mr. V." was "busted." However, I am not slurring "Mr. V." at all, he may be able to buy ten yards like ours, but I am sorry he is so far behind the times. Ten or fifteen years ago the man that had a brick machine was odd but now the man that makes brick by hand is way behind the times. Another thing, Mr. Village Brickmaker, if we at our works didn't make over $2.38 per thousand profit on our brick we would sell out. Look here, we make about a million brick in the season which would be $2,380 at the profit named. Now if that is too much for one year after living out of it and wear and tear of machinery we would like to know. You ask, "Are we here to stay?" We answer no. We venture to say that in ten years from now the hand yards will be as scarce as hen's teeth. We have the grit to tell just what profits we make and would have answered it long since had we noticed it before. We sell brick for $5.25 and our profit is $2.97 per thousand. We agree with you inasmuch as you say all men are not qualified to run machinery and we are afraid the Village Brickmaker is one of that kind inasmuch as he has seen machines in operation so long and hasn't yet seen any good in them. Well, Mr. Village Brickmaker, you can believe as you please and we "City Brickmakers" can believe as we please. We hope you will not be offended for we are only giving you a little of our experience. A. SKIMMER.

Washington, Iowa.

A Skeptic Brickmaker.

Editor Clay-Worker:

I am comparatively young in the brick business but I have tried for nearly twenty years to be an earnest seeker after knowledge in connection with the manipulation and burning of clay. I have read carefully everything that has come in my way on these subjects. I have made my full share of mistakes, and until I saw the last number of the Clay-Worker was unaware why I had so signally failed. With J. W. Crary, Sen.'s record of more than thirty years before me, and his conclusions so sure and certain, I am now satisfied that I lack either the intelligence, the inventive genius or the patient industry and perseverance so requisite to success. It is possible that more than one of these elements has failed to put in an appearance in my experience. Another reason may be that I have lacked that power of discrimination amounting almost to intuition that would enable me to secure the services of the *very best* and *most* skillful and practical brickmaker. It is just such a man as J. W. C., Sen., describes himself to be that I have been looking for.

Seriously, my dear editor, I question very much the propriety of holding out such glowing inducements to capital to embark in our trade. I question the wisdom of such advice as J. W. C., Sen., gives so freely.

He says he cannot tell any man just how he can burn perfectly a kiln of brick. Can he any more easily tell how to select the man who *can* burn brick perfectly? It seems to me a little unfair to expect every brickmaker to be as fortunate as the three firms who secured *his* services. In the evolution of brickmakers J. W. C., Sen., may be reproduced and possibly improved upon.

I am hopeful, for Emerson says: "We are all wise in capacity though so few in energy, there needs but one wise man in a company and all are wise, so rapid is the contagion * * * Yet within the limit of human education and agency we may say great men exist that there may be greater men."

JAMES JOHNSON.

Lacks Faith.

Editor Clay-Worker:

It is an easy matter to set down in an office and draft the plan for a kiln that will require so many brick or tile to fill, and so many atoms of heat to burn the ware, and write out the rules by which any greeny can make as good a burn as the experienced burner if he only follows the rules laid down. To illustrate our idea, we may say, it is like a gun, it takes so much powder and a certain pitch to hit the target. When this is determined the bull's eye can be hit every time.

That is, we can always have the same kind of a burn, same color, same hardness, and no loss. That such a kiln will be in operation soon on a large scale, etc. And when we have made all the nice points in our ideal kiln the bones of some old brickmaker turn over in the grave to say, "That's an old chestnut." And some live practical brickmaker is so unmindful of our feelings as to say: "You are a —— fool."

So it is, men are not appreciate in their day and generation because they are hindered some way in realizing their fanciful ideals.

When we reach the point that we can watersmoke in exactly a given time, raise the heat to different degrees of temperature in exactly so many minutes with a given amount of fuel and then complete the burn by rule, and have the same result in a hundred, yes, a thousand times, regardless of wind, weather or other contingencies that we cannot control, then will be ushered in the clay workers' millenium. Yea, verily.

PETER SIMPLE.

A Paving Brick Plant.

Editor Clay-Worker:

We are so well pleased with the Clay-Worker that it affords us pleasure to enclose herewith our subscription.

We have been engaged here in the manufacture of the ordinary building brick for a number of years and have lately taken a large contract for making paving brick for the city. We have bought of J. W. Penfield & Son, Willoughby, Ohio, their largest No. 10 D Brick Machine, Crusher, Pug Mill and plant complete. When in full operation, will have a capacity of 50,000 per day. We saw their advertisement in the Clay-Worker, wrote to them along with others for catalogue and prices, telling them we had taken a large contract and wanted to purchase machinery and a complete plant. We do not believe that we will have any occasion to regret buying it. We have an Atlas Engine made at Indianapolis, Ind, 90 h.p., and have an inexhaustible supply of the finest of shale, which, according to the report of our State Geologist, J. C. Branner, is equal to that of Akron, Ohio, which is considered the finest body of clay in the United States.

The following comparative statements may interest some of your readers. No. 1 is our clay.

No. 1.
Bocquin & Reutzel.
Analysis of the clay shale exposed by the road leading south from Fort Smith, and just south of the rifle pits on "Nigger Hill."

	Per Cent.
Silica	58.43
Alumina	22.50
Oxide of iron	8.36
Lime	0.32
Magnesia	1.14
Potash	2.18
Soda	1.03
Sulphur	0.16
Loss on ignition	6.87
	100.99

No. 2.
Analysis of the shale at Akron, Ohio, for the manufacture of sewer pipe.

	Per Cent.
Silica	60.05
Alumina	20.00
Oxide of Iron	6.82
Lime	0.52
Magnesia	0.45
Potash	1.79
Soda	1.60
Sulphur	1.95
Loss on ignition	7.93
	101.11

No. 3.
Analysis of the gray clays overlaying the sandstone of Harding & Boucher's quarry, about a mile and a half south of Fort Smith. This clay is produced by the decomposition of clay shales similar to No. 1 mentioned above.

	Per Cent.
Silica	57.10
Alumina	23.74
Oxide of iron	8.18
Lime	0.53
Magnesia	1.04
Potash	1.53
Soda	0.87
Loss on ignition	7.21
	100.20

No. 4.
Analysis of the upper mottled portion of the clay overlaying the sandstones of Harding & Boucher's quarry south of Fort Smith.

	Per Cent.
Silica	65.12
Alumina	19.05
Oxide of iron	7.66
Lime	0.34
Magnesia	0.31
Potash	1.23
Soda	0.85
Loss on ignition	6.12
	100.68

We now have one contract for street paving that will require two and a half million brick. BOCQUIN & REUTZEL.

Fort Smith, Ark.

The landlord of a hotel at a fashionable summer resort asked a witty guest who was about to leave if he would not write some sentiment below his autograph on the hotel register. The wit immediately wrote "I came here for rest and change. The waiter has the change and the landlord has the rest."

JONATHAN CREAGER'S SONS,

MANUFACTURERS OF

The Latest Improved Brick Machinery, Cincinnati, O.

The "Grand Automatic" is the only machine on earth having an Automatic Pitman that affords absolute relief and regular pressure. Our complete plants of brickmaking machinery are combinations of practical improvements and labor-saving devices. If you are making brick to make money, we solicit your attention. If you wish to make all perfect brick and make them cheap, our machine is the one you want. Do not allow yourselves to be taken in by machines that are claimed to be "equally as good as our Automatic", *for they are not.* Experience is a good teacher, but rather expensive. Correspondence solicited.

:o:

Testimonials.

(Copy.)

TENNESSEE PAVING BRICK CO.,
Manufacturers of
Granite Street Paving Brick.

Robbins, Tenn., Sept. 14, 1889.

Jonathan Creager's Sons, Cincinnati, Ohio.

DEAR SIRS—Enclosed please find order for your "Special Grand Automatic', Steampower Brick Machine, with automatic pitman, iron rails and table, arranged to make brick from 2½ to 6 inches thick and 12 moulds to accompany same. The sizes of moulds are as follows: 9 3-16x4 11-16x2 11-16. We wish to have these moulds made so that we can have plates put in the bottom with word "GRANITE," and would like you to do it for us. Please let us hear from you and oblige Yours Truly,

W. M. TASLEY, Sec. and Treas.

(Copy.)

Office of
FORT PAYNE COAL AND IRON CO.,
Fort Payne, Ala., Sept. 23, 1889.

Messrs. J. Creager's Sons,

GENTLEMEN—Enclosed please find requisition for machinery and tools for our Fire Brick Works which, we trust, you will be able to deliver to us at Fort Payne within the time mentioned.

Respectfully Yours,
Fort Payne Coal and Iron Co.
Per W. Keith.

Office of
BALTIMORE BRICK COMPANY,
1142 Main Street,
Richmond, Va., Aug. 28, 1889.

Messrs. T. B. Townsend & Co.,
Zanesville, Ohio.

GENTLEMEN—We have contemplated for some time purchasing a brick machine and upon an examination of most of the catalogues, were very favorably impressed with the Grand Automatic, manufactured at Cincinnati, O., by Messrs. Jonathan Creager's Sons, and when we noticed your testimonial of April 6th, 1887, stating you were well satisfied with the machine you purchased from them, we thought more of it, and concluded to write and trouble you to tell us in plain terms what you think about the Grand Automatic. A word of commendation from a Company which enjoys the enviable reputation enjoyed by your concern throughout the country, would have more influence upon us than what a dozen manufacturers would say in praise of their productions. If this is not asking too much of you, please answer at your convenience. Yours, Etc.,

FORBES & MANN.
Per Mason.

Office of
T. B. TOWNSEND & CO.,
Manufacturers of
Red Pressed, Ornamental, Enamelled and Common Brick,
Zanesville, Ohio, August 30, 1889.

Messrs. Forbes & Mann, Richmond, Va.

GENTLEMEN—Your letter of recent date to hand and replying will state, we have two of "the Grand Automatic's" in operation with a daily capacity of 25,000 brick each and if we could manage to take the brick away from the machines, we could just as easily make 30,000 to 35,000 per day. We make six brick at a time and we use both steel and wood pallets. We have one of their first machines in use, but it is not nearly so good as the latest improved machine, although it makes brick the same, yet they have strengthened the weakened parts and parts that were apt to give way so they are now safe machines. We have tested a number of machines, having them all put in on our yards on trial, which was the only way we would take them and until we got the "Automatic" we were never satisfied. Now we are not in the habit of giving testimonials, and do not think it is the best policy always, but if you are going to purchase a machine, we do not know what to advise you to get outside of one of Creager's machines. The price is not exorbitant and the power to run one does not exceed six horsepower, probably twelve horsepower including pug mill, which you would want to go with the machine. For the quantity and quality of brick it turns out, we think it requires less power to run it than any other. Whenever we run our machine at a capacity of 28,000 per day, we are making them for just one-half what it costs to make them by hand, so you can see there certainly is a saving in using their machine. Then the brick made by hand are not to be compared to those made on the machine, as the machine brick are more compact and straighter. If we were going to give you advice, we would say: Buy the "Grand Automatic" Machine. Yours Truly,

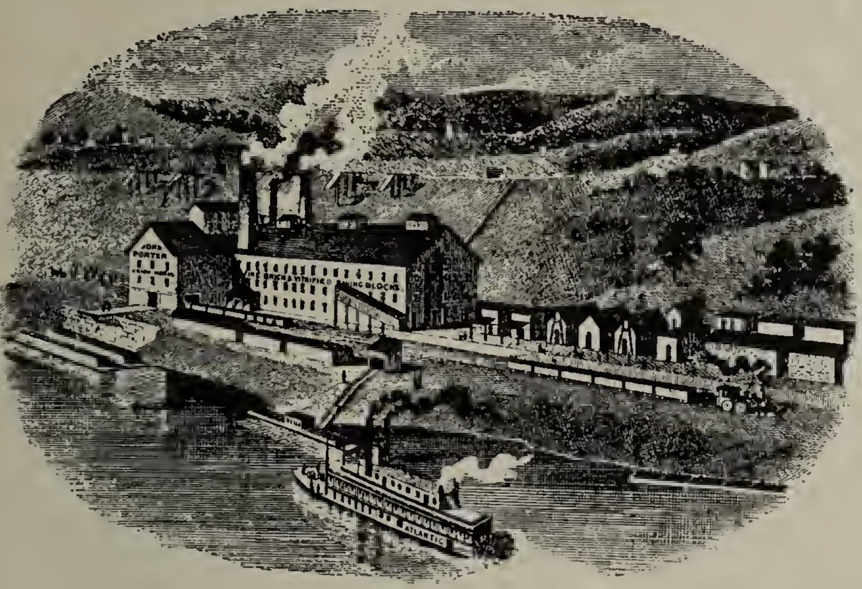
T. B. TOWNSEND & Co.

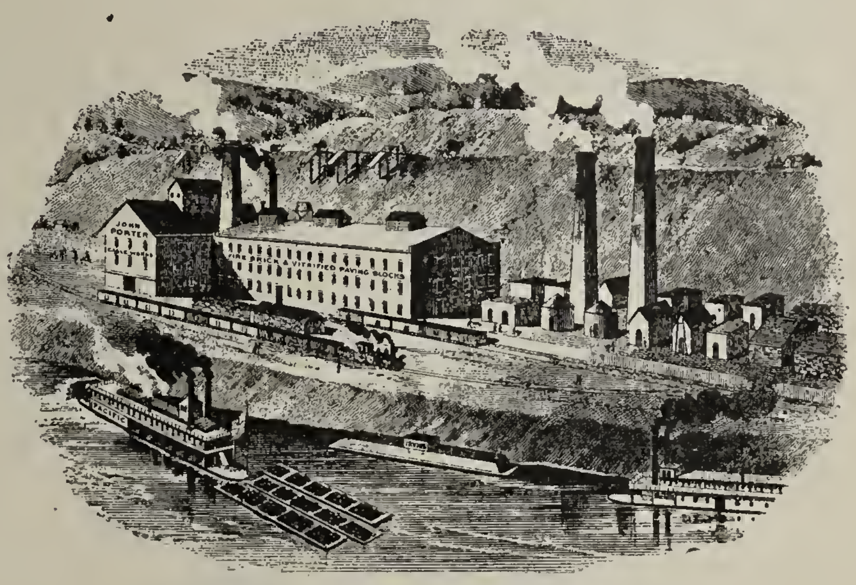
:o:

We have received (October 8th), an order from the Baltimore Brick Co. for a plant consisting of Brick Machine, Pug Mill, etc., and we will certainly show the City of Richmond some brick to be proud of.

For catalogue, prices and any further information, address

JONATHAN CREAGER'S SONS,
127 West Second Street,
CINCINNATI, OHIO.


UNION WORKS.

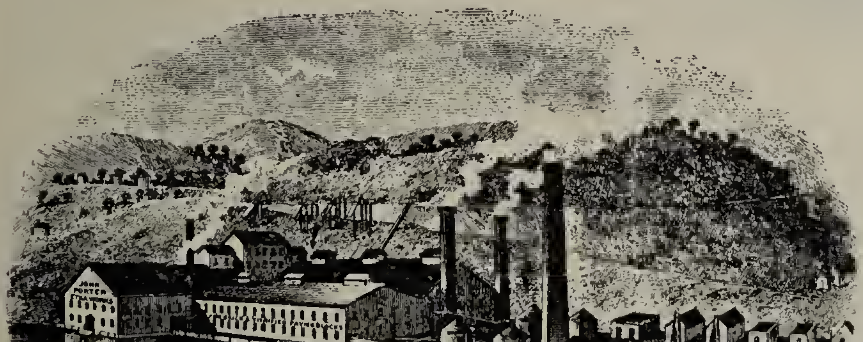

EAGLE WORKS.

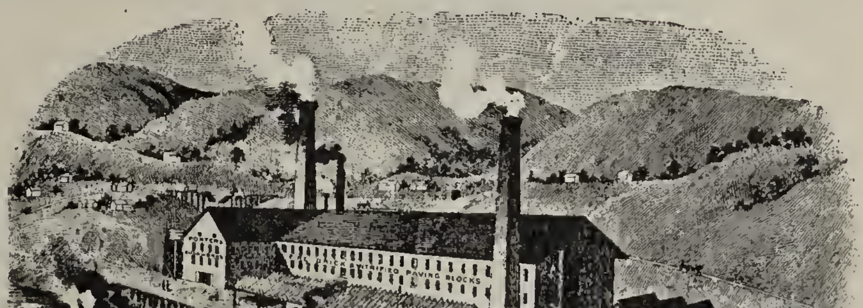
The four works of John Porter, pioneer in the manufacture of Fire Brick and Vitrified Paving Blocks, and brick for streets and roadways. The largest works of the kind in the world under one management.

Located along the Ohio River at New Cumberland, West Virginia, on P. C. & St. L. Railway, 47 miles west of Pittsburgh. The machines used in the manufacture of these brick are the "Fire Brick Specials," manufactured at Cincinnati, Ohio, by Jonathan Creager's Sons, who will promptly furnish all information regarding the most recent improvements in brickmaking machinery and will cheerfully make you an estimate for your wants. Consult your best interests and also

JONATHAN CREAGER'S SONS,

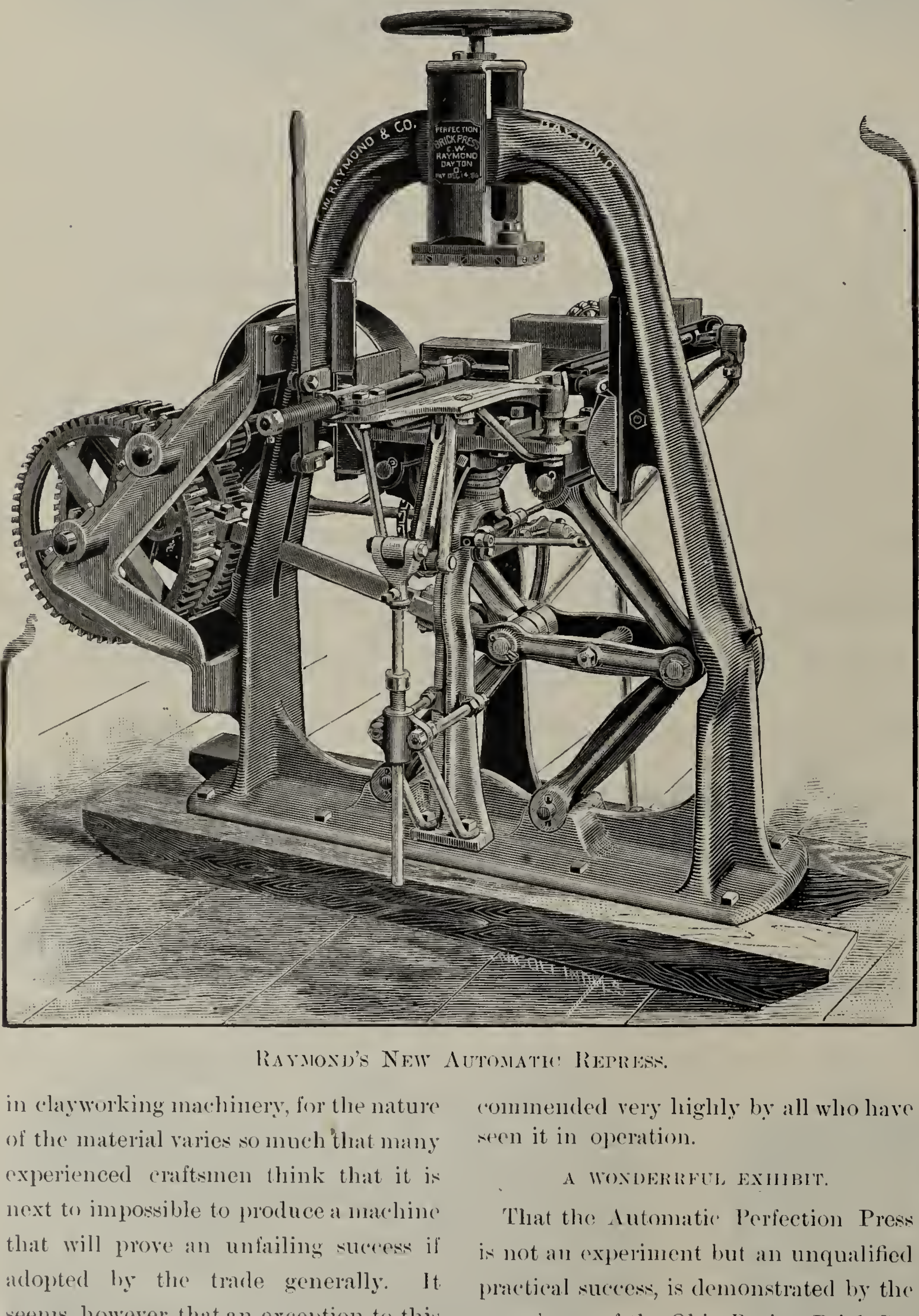
☞READ THE OPPOSITE PAGE. (Mention the Clay-Worker.) **CINCINNATI, OHIO.**


ETNA WORKS.


SLIGO WORKS.

A REMARKABLE SUCCESS.

It is seldom that a machine involving a new principle is successfully introduced and put into practical operation in the exact form designed by the inventor, for however perfect it may seem in theory and appearance, when the test of practical every day use is made, nearly always, weak points are found that must be remedied before satisfactory results can be attained. Especially has this been true in clayworking machinery, for the nature of the material varies so much that many experienced craftsmen think that it is next to impossible to produce a machine that will prove an unfailing success if adopted by the trade generally. It seems, however, that an exception to this general rule may be noted in the introduction to the trade of the New Automatic Repress, of which we present an excellent illustration. A few months ago the first Automatic Repress left the shop and was put in operation on the yard of the Royal Brick Co., of Royal Ohio. To the delight of the inventor and surprise of the purchaser it did all and more than was claimed for it. From the very start the Automatic feeding device worked to perfection and the brick made proved in every way equal to those repressed by hand. This, the first machine, has been in use ever since, and is commended very highly by all who have seen it in operation.


C. W. RAYMOND & CO.
PERFECTION BRICK PRESS C. W. RAYMOND DAYTON O.
DAYTON O.

Raymond's New Automatic Repress.

A WONDERFUL EXHIBIT.

That the Automatic Perfection Press is not an experiment but an unqualified practical success, is demonstrated by the experience of the Ohio Paving Brick Co., where five of these presses have been running for several weeks and now that Company order six more, making eleven that will be in operation on this one yard.

Read the following remarkable correspondence:

(Copy.)

Office of
The Ohio Paving Co.,
Columbus, Ohio, Oct. 5, 1889.

C. W. Raymond & Co., Dayton, Ohio,

Gentlemen—Please make and ship to us as soon as possible six additional power repress machines like the last you sent us, to be used in our new factory for the manufacture of our new patent Halwood Paving Blocks. The five machines now in use are working to our entire satisfaction, each making from 10,000 to 12,000 perfect paving blocks per day. Yours Truly,

The Ohio Paving Co.

(Copy.)

Office of
Fox River Brick Co.,
Dayton, Ills., Sept. 3, 1889.

C. W. Raymond & Co.,

Gentlemen—It gives us great satisfaction to testify to the good qualities of your Automatic Repress. It is a perfect machine and does the work of four men, making a great saving in point of labor, and always giving uniform bricks.

Very Truly Yours,
Fox River Brick Co.,
Per A. E. Williams, Gen'l Man.

(Copy of Telegram.)

Royal, Ohio, Oct. 3d, 1889.

C. W. Raymond & Co.,

Your Automatic Machine is pressing ten thousand fine brick daily. Will put in two more soon, Particulars by letter.

The Royal Brick Co.

During the past few years many attempts have been made to produce a machine of this character but with little success. Mr. Raymond's skill and inventive genius have, however, at last proven equal to the emergency and another labor-saving device is added to the long list which plainly marks this the age of invention.

We congratulate the manufacturers of the "Automatic Perfection" which comes to fill a long felt want and the craft as well on the notable success achieved. Those desiring further details should address the manufacturers, C. W. Raymond & Co., Dayton, Ohio, for illustrated circular, mentioning the Clay-Worker.

OUT OF THE ASHES.

Edgar M. Heafer, Bloomington, Ill., has just completed his new tile works upon the same site occupied by the old works which were destroyed by fire a few months ago. The new brick building is 80x175 feet, two stories in height, with basement system of steam pipes for drying, requiring about 14,000 feet of iron pipes. Every convenience has been provided that the proprietor judged to be of real advantage to the business. There are two Brewer mills in position. The power provided to run the machinery and heat the works is a 75 horse-power engine and boilers, using dead steam by day and live steam at night. They have also recently built four common down-draft kilns 20 feet in diameter inside. Mr. Heafer says: "After years of experience in the use of different kinds of kilns, some of our own invention included, I like the old down draft kiln best."

OFFICIAL ANNOUNCEMENT.

Fourth Annual Convention of the National Brick Manufacturers' Association to be held in Philadelphia, Pa., Tuesday, Wednesday and Thursday, December 10, 11th and 12th, 1889.

As announced in the official report of the proceedings of our last annual convention, the next yearly meeting will be held in Philadelphia, Pa., Tuesday, Wednesday and Thursday, December 10th, 11th and 12th, 1889.

This time and place was chosen by the Executive Committee after carefully canvassing the matter several months ago, and meets with much favor from members of the craft generally throughout the country.

In as much as this is our first convention in an eastern city there will undoubtedly be a marked increase in attendance from the Eastern and New England States while the Western and Southern craftsmen, having already felt the benefits gained from our yearly meetings, will take advantage of the opportunity to visit and become better acquainted with the Eastern brethren and by personal inspection acquaint themselves more fully as to the methods of manufacture now in vogue there.

The brickmakers of Philadelphia and vicinity are now all members of our Association and heartily interested and identified with us in the work, thus assuring a most cordial welcome to every one who can meet with us.

It is with no little pleasure therefore that we announce that arrangements have been made for reduced railroad rates over all the leading lines in the Eastern, Central, Southern and Western States. A complete list of these lines will be given in the next issue of this journal together with the Programme which is now being prepared.

Anyone desiring further information as to the objects of our association with a view of becoming members will please address the Corresponding Secretary, Mr. Theo. A. Randall, Indianapolis, Ind., from whom also may be obtained copies of the proceedings of the last convention. Respectfully,

THE EXECUTIVE COMMITTEE,
by R. A. Speed, *Pres.*
T. A. Randall, *Cor. Sec'y.*

AN INTERESTING LETTER FROM ABROAD.

My Dear Randall:—The enclosed letter from Brother Stevens, of Philadelphia, although a private letter seems to me worth publishing as containing information of interest to the craft.

Sincerely your friend,
D. V. Purington.

Dresden, Sept. 19, '89.

D. V. Purington, Esq.,
Chicago, Ill.:

My Dear Sir and Brother:—Knowing how much interest you take in the subject of "Uniform Size of Brick," we thought we would examine and note the sizes used in the different countries through which we are traveling.

We find that they are far from uniform either in size or shape, over here. We have found some that measured only 6 in. long by 2½ in. wide by 1⅛ in. thick, and others 12 in. long by 6 in. wide by 2½ in. thick, with all sorts of intermediate sizes, so we have given up the idea of finding a "specimen brick" that would answer for a "standard."

Perhaps when we get into Egypt we may find one of the bricks, that Brother Adams told us about, which were made when Moses "run a brick yard," or possibly we may stumble over the "Tower of Babel" in our travels; if so we would be tempted to secure a "regular *old* brick" and bring it home for you.

On second thought I fear I could not, for they *weigh* our baggage, over here, and we have to pay so much a Kilo for the transportation, and I have no notion of exhausting my Letter of Credit and bankrupting myself in a foreign country.

I could, of course, bring it home in my hat, but then it would not look well for an "ex-president of the National Association of Builders of the United States" to come home with a "brick in his hat," would it?

I might possibly borrow Brother Watson's "Kodack," and send you a ground-plan and elevation of *one*, with a specification attached.

However, we will decide later what is best to do in the premises.

I trust you and all our Chicago friends are as well as we are, and enjoying yourselves as much. Give our kindest regards to them all, and accept a share for yourself from

Yours very sincerely,
John S. Stevens.

[We are pleased to give place to the above for we know that very many of our readers will be delighted to hear from Mr. Stevens, who is one of Philadelphia's best known and most honored citizens. As President of the National Association of Builders, Mr. Stevens made hosts of warm, true friends who will ever remember his kindly, genial demeanor with real pleasure.—Ed.]

NEW INVENTIONS.

The following is a list of patents appertaining to brick, tile, terra cotta, sewer pipe, pottery, etc., and the machinery used in their manufacture, issued since our last number: (A copy of any of them can be obtained by sending 25 cents, the official price, to Chas. E. Brock, Patent Attorney, 925 F St., Washington, D. C.)

410,245. Burning-Brick—J. M. Jameson, Los Angeles, Cal.
410,455. Tile Machine—W. D. Sherman, Omaha, Neb.
410,285. Mold for Tubular Articles—J. Kinzer, Pittsburgh, Pa.
410,788. Brick Kiln—S. Dewhirst, Voris, Mo.
410,742. Pot Furnace—M. V. Smith, Pittsburgh, Pa.
410,756. Pulverizing Mill—E. C. Griffin, Brooklyn, N. Y.
411,232. Brick Machine—G. Van Deventer, Matawan, N. J.
411,296. Brick Machine—J. W. and R. Penfield, Willoughby, O.
411,228. Brick Mold Sanding Machine—G. E. Smith, Kingston, N. Y.
411,010. Paving Brick—H. B. Camp, Tallmadge, Ohio.
411,069. Burning Clay for Ballast—C. M. Snyder, Mt. Pleasant, Iowa.
411,027. Clay Fence Post—W. H. Heindel, Majenica, Ind.
411,299. Roofing Tile—J. Rapp, Akron, Ohio.
411,726. Brick Kiln—V. Nielsen, Odense, Denmark.
411,645. Brick Machine—O. L. Dieckman, St. Louis, Mo.
411,546. Machine for Cutting Brick—W. R. Cunningham, Frankfort, Ind.
411,413. Machine for Making Building Blocks—J. C. Anderson, Highland Park, Ill.
411,463. Scoop for Clay Mills—E. J. Mildren, Black Lick, Pa.
411,690. Tile Cutting Machine—T. Somerville, Jr., Washington, D. C.
411,638. Tile Cutting Table—J. Bensing, Malinta, Ohio.
411,666. Roofing Tile—P. Liddell, Blakeman, Kan.

THE CLAY-WORKER

INDIANAPOLIS, IND., Oct., 1889.

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Six copies "	5.00
Ten copies "	8.00

☞Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES furnished on application.

Correspondence on all subjects of interest to Clay Workers is solicited. Communications from practical men will always be welcome. Address all communications to

T. A. RANDALL & CO.,
14 & 16 S. Tenn. St., Indianapolis, Ind.

THINKS IT FILLS A GAP.

Through the kindness of friends (the publishers having failed to extend us the courtesy) we have been favored with a copy of a new publication entitled "The Brickmaker," published by Charles T. Davis & Co. Chicago, Ill. In a long introductory the publisher says, in substance: That the organization of the National Brick Manufacturers' Association has resulted in the collection of a vast amount of information and that there is a demand for a readjustment of the principles and practices of brickmaking in all its branches, after centuries of misapplication; that the process will be slow, requiring judicious treatment and watchful care, etc. That the periodicals already established did not seem to cover the ground required, therefore there existed a gap which Messrs. Davis & Co. very kindly propose to fill.

However, there is a little matter of history with which Mr. Davis may not be familiar. The very same National Brick Manufacturers' Association was the Clay-Worker's own child, so to speak. The Clay-Worker first suggested the advisability of such an organization, heralded its coming, aided in the preparation of the necessary wardrobe, and from the first has provided a part, at least, of the lacteous supply necessary to the development of the infant's proportions and in due time aided somewhat in supplying the more substantial elements of food. So far as we have been informed by the craft the child has not wanted for anything. The process of development may have been slow, but mature. No one has been mislead as to its real character. There are no abnormal developments in any of its parts. It is an easy matter to promise much in the way of "readjustments" but we have learned that business tact takes hold of things on the practical side.

We have not the least objection to the establishment of the publication above referred to. The field is open and promising to every one that will enter with the determination to labor for the benefit of the craft. Honest toil will be appreicated. Every practical idea hammered out and made a blessing will be gladly welcomed.

But few will believe, however, that the publications already established have left a *wide* gap for our new contemporary to fill. Indeed we think it will do well to keep up with the procession.

The craft has a very practical way of treating things, their experience in developing the best methods of working various kinds of clay, and the intricacies of their business has sharpened their wits to a point that they care little for theories that are not backed up by practical tests. It is one thing to discourse learnedly about readjustments, but the shrewd tact on the practical side will strip off the covering and show up the real, or as Butler's Hudibras puts it:

"Cannons shoot the higher pitches,
The lower we let down their breeches."

BRICK THE BEST BUILDING MATERIAL.

In spite of all that has been said of other building materials (whose name is now legion) brick is still, and is likely to remain the favorite building material. There is nothing except a Wedgewood crucible that will withstand fire nearly so well, and the smoothness and sharpness with which good bricks for fronts can now be produced with cheapness and dispatch, puts this material further in the lead of its competitors in their respective processes. Rough brick, while not intended for fronts or decorative purposes, are fully as good for party and inner walls provided they, as rough brick, are well made. Iron is confessedly unfit for building purposes where it may be exposed to the weather or fire and is rapidly going out of use. Stone will always have its uses in combination with brick and terra cotta, but stone will not weather any better in this climate than well burned brick, nor does it begin to withstand fire as well, besides even with every improvement in the manipulation of stone, it is so much dearer as to leave it out of competition with brick for the heavy portion of the walls.

It is not maintained that there is not an inevitable and proper place for stone, but its use is necessary in an artistic, not in the utilitarian sense. A brick front or a building where walls were equally as massive as stone fronts, would be as strong or stronger, and certainly much less liable to injury from fire. But it will be observed that even in those buildings where stone is preferred either for its color, smoothness or general effect, massive walls of brick are used in the divisions and rears. The use of various materials is wise and the effect upon the architecture of a city is handsome, but when enthusiasts in one or the other materials assert a supremacy of their favorite over brick, they reckon without their host.

This is capable of historic proof. Egypt, the land of all others where stone was most available, dealt yet more heavily in brick. Along with her ruins of stone are yet to be seen imposing piles of brick, and sun baked brick at that, not more time-worn than the massive stones around them. While the sun baked brick of the cities of Assyria under that damp, hot climate became in course of ages, shapeless mounds, the kiln baked face bricks of that age are as sharp and clean as ever and testify to the indestructibility of a well made brick. Parts of the walls of Rome built by Aurelian, of brick, still remaining practically perfect in the ruins of those walls not utilized in the building of modern Rome. But it is hardly necessary to cite instances of the durability of brick. It's friends cannot add to its durability, nor its enemies say more against it than that a brick wall or building is not artistic.

But let us see about this. The rectangular cube known as a brick does not exhaust the brickmaker's resources. Lately, burned clay is springing into forms as fanciful as those of Alhambra. There is a mobility and springiness possible to terra cotta art that can only once be reproduced in stone and that once by an artist whose life work in that production has made it so expensive as only to be used in an art gallery. It is the mold against the chisel and while it may be equally difficult to make the mold as to carve the image, the mold is prolific of young till the offspring literally fill the earth. The art forms that are springing into terra cotta as a medium of general culture are but a single step behind the printed book as an educator, and in fact, there is not so much difference in printing on paper with ink and on clay with forms.

OF THE PRESENT AND FUTURE.

Like "Little Puck," "we don't like to talk about ourself, but—" our readers will observe that we make another stride forward with this issue. Though we have received no orders for space by telegraph, the demand from our old patrons and a few new ones compels us to again enlarge the Clay-Worker, it now numbers 78 pages, which, considering that it *is not* a "special" issue, is a very creditable, and, to us, gratifying exhibit.

We have received too late for this issue several very interesting communications. The next (November) issue will be, we think, an exceptionally valuable number. Don't miss it on any account.

EDITORIAL COMMENT.

Our old friend and neighbor, John Hensley, looked in upon us recently shedding the bright light of his happy countenance throughout our sanctum. John, (we can't think of calling him Mr. Hensley), is now residing in Memphis, and is evidently much pleased with the Sunny South as a place of residence. He has been superintending the yards of the Tennessee Brick & Mfg. Co. the past season and reports a prosperous condition of affairs in that section.

* * *

It was our good fortune recently to visit the factory of the **American Terra Cotta & Ceramic Co.**, at Terra Cotta, Ill., and again break bread with our good friend and true, Wm. D. Gates, who is President and General Manager. We found them "busy as beavers" turning out a large quantity and fine quality of architectural terra cotta. They now have several large contracts under way and have already this season supplied a number of important buildings with their ware. We were especially pleased to note the many signs of prosperity plainly observable for it is meet that intelligent industry and scrupulous integrity, which here go hand in hand, should reap a full measure of success.

* * *

While at Galesburgh, Ill., recently, we availed ourself of the opportunity to call at the works of the **Frost Engine** Co. and inspect their Dry Pans and Engines. The Manager, a most genial gentleman whose name we cannot recall, bade us a hearty welcome and in answer to our query "How's trade?" said they were quite busy and had had a prosperous season. Since they began to advertise in the Clay-Worker the former has become an important feature of their business. They find there is a growing demand for heavy machinery of large capacity for reducing clay to suitable condition for the manufacture of brick by the stiff clay process. Their Dry Pans seem to "fill the bill," for those who are using them are very well pleased, if we may judge from the many testimonial letters the Frost Engine Co. have received. From its massive appearance one is lead to believe that their Dry Pan is built for all time.

* * *

The good people of Detroit are to be congratulated on the success of their maiden effort in the Exposition line. The buildings, which were erected for the occasion, though large and commodious, were crowded with the products of American and foreign manufactories. The attendance was large and in every respect the Detroit Exposition was a pronounced success. In the machinery department we found **The New Duplex Brick Machine** in operation. The pile of brick baked near the machine, though mute, spoke volumes for the efficiency and perfection of the Duplex. The manufacturers, Messrs. F. Huetteman & Co., of Detroit, were pleased with the favorable attention paid their exhibit by visitors. The brickmakers in that vicinity, however, are one and all familiar with the Duplex and hold it in high esteem, as evidenced by the fact that it is the only brick machine now in use there. The manufacturers report a growing demand for the machine and state that wherever it has been placed in operation orders for additional machines have followed. This in itself is a strong recommendation for the Duplex—a cut of which may be seen on another page of this journal.

* * *

A representative of the Clay-Worker recently stopped off between trains at Keokuk, Iowa, and had a brief but pleasant chat with Mr. **H. O. Whitney** Gen'l Agt. of the well known **Andrus Brick Press**. In company with Mr. Whitney a visit was made to the shops where a new extra heavy four-mold press was found in course of completion. It will doubtless prove a dangerous rival for trade honors for it has the appearance of great strength and efficiency—qualities that have won a front place for the "Andrus" among the successful dry press machines. Mr. Whitney expressed himself as well pleased with the business of the present year and thinks the dry press process is rapidly gaining favor among the progressive brickmakers, at any rate the demand for the "Andrus" is increasing each year. The present season has been very prosperous and the next bids fair to be still better.

* * *

The Chicago Exposition attracts but little attention from the busy people of that most busy city, the visitors being mostly pleasure seekers from beyond the corporation lines, which, by the way, are rather hard to locate, for they are constantly creeping out into the prairie and converting farm lands into town lots, parks and boulevards, at a rate that is suggestive of magic. Those who do visit the old familiar place, however, find much the same "displays" that have pleased the eyes of the sight seers for several years past. The venders of peanuts, cider, etc., are still doing business at the old stands. We remember this distinctly for the reason that we made our last trip to the Exposition in company with our friend "Charlie" Raymond, of Dayton, O., and had much difficulty in preventing him from squandering a large portion of his hard earned fortune for those luxuries. In the machinery department we found **H. Brewer & Co.**, of Tecumseh, Mich., exhibiting a line of brick and tile machinery. The most notable feature of which being Brewer's New Automatic Brick Cut-off, which worked like a charm. It is a novel device and will prove a valuable addition to this firms already large line of clay working machinery. Mr. Chambers, who had charge of the display, informed us that the new Automatic Cut-off has been attached to many of their brick machines during the past season, all giving entire satisfaction. Just beyond the Brewer exhibit is a large and attractive display of Conveyors and Elevators of various kinds made by the **Link Belt Machinery** Co., of Chicago, who have improved their machinery till it is perfection itself almost. Their parcel or package carriers for conveying barrels, boxes, ores, clay, etc., etc., are great labor saving devices that must be seen to be appreciated. Those who cannot visit the Exposition and see this remarkable exhibit should do the next best thing, write the Link Belt Co. for an illustrated catalogue.

EDITORIAL NOTES and CLIPPINGS.

R. F. Beck will start a brick yard at Vicksburg, Miss.

The Standard Brick & Terra Cotta Co., New Straitsville, O., has been incorporated.

James McCullough will double the capacity of his brick yard at Quintette, Fla.

St. Louis is to have a new $1,000,000 City Hall to be built of Missouri brick and granite.

The Brick & Terra Cotta Works at Alfred Centre, N. Y., are enlarging their plant.

The Rockwood Pottery Co., of Cincinnati, was awarded two gold medals at the Paris Exposition.

The Rochester (Pa.) Pottery Works recently destroyed by fire will be rebuilt at once.

Charles B. Whittemore, brick manufacturer, Pembroke, N. H., has gone into insolvency.

The Chicago Retort & Fire Brick Works have filed a certificate of dissolution.

The Spa Spring Brick Co. has been organized and will erect works at or near Perth Amboy, N. J.

The Elgin (Ill.) Brick & Tile Co. has sued D. H. Haeger, of Dundee, Ill., for $50,000 for breach of contract.

C. W. Clark and T. T. Johnson have organized a company to manufacture brick near Little Rock, Ark.

The American Encaustic Tiling Co., of New York, are thinking of erecting new works in New Jersey.

The Hermetic Fire Brick & Clay Co. has been incorporated by Foster C. Griffith, of Trenton, N. J., and others.

H. V. Hardwick and others, of Almon, Ga., have organized a company to build brick and tile works; capital stock, $30,000.

The brick and tile works of Kier Brothers, at Salina, Pa., were destroyed by fire recently, the loss being $4,800.

Wm. Boyle, Jas. M. Bailey and others, of Pittsburgh, Pa., have organized the Pittsburgh Clay Pot Co., with capital of $160,000.

Mayor Kirk, of Syracuse, N. Y., and others, will organize a company with a capital stock of $100,000, to manufacture brick and terra cotta near there.

The scheme to organize the brick manufacturers who supply the New York City and vicinity markets into a monopoly will probably not succeed.

Fletcher & Thomas report their fall trade as booming, with the prospects for the coming season away ahead of former years, especially throughout the South and Southwest.

Mr. C. Scotten, formerly of Moark, Ark., in renewing his subscription, writes: "I am now located at Ft. Wayne, Ind., and am thinking of going into the brick business here, so I can't do without the Clay-Worker. Ft. Wayne is growing rapidly. The brick business is good, the present yards being unable to supply the demand."

J. B. Clough, of Deland, Fla., has contracted with Chas. Kaestner & Co., of Chicago, for a two-mould Brewis Brick Press, Clay Pulverizer, Shafting, Pulleys, Etc.

The Avery Stamping Co., Cleveland, O., say they don't know much about corrugating rolls but can give any information wanted in regard to Corrugating Buckets, Etc.

The Builders Material Co., of Seattle, Wash., have added a large Eureka Dry Press Machine to their plant. It is the first machine of the kind started in Western Washington.

Jno. Dillon, Sec'y and Treas. of the Charlemagne Lumber Co., Montreal, Canada, desires information concerning the dry press process with a view of engaging in the business.

The Steelton Transfer Co., have purchased another Martin Steam Power Brick Machine, together with Horizontal Pug Mill, Elevator, Crusher and attachments, for their new yard at White House Station, Pa.

Murrell Dobbins, the well known brick manufacturer of Philadelphia, says the past season has been the worst for brickmaking in that section of any for twenty-five years, owing to the excessive rain storms during the summer.

Thomas F. Burbank, superintendent of the Bay State Brick Co., Boston, Mass., while driving home from the works on Monday, Oct. 7th, was run into by an express train on the Fitchburgh railroad and instantly killed.

Geo. Hoertz, of 2011 Third Avenue, Louisville, Ky., advertises for bids for ditching a four hundred acre tract of land. See his ad. in the "For Sale, Wanted, Etc." column, or, better, write him for particulars.

The Diamond Fire Clay Company, of Urichsville, O., are endeavoring to purchase the output of the Globe Sewer Pipe Company, of Pittsburgh, Pa. This will put the aggregate output of that district into the hands of one firm, giving them entire control of the market.

Tiffany Pressed Brick Co. received an order in May for their brick to be shipped to Ellensburgh, Wash. Ter., and it was followed by several orders in June and July from the same point. They are now filling an order of 15 car loads for Seattle. The freight on these cars average $370 per car.

The Rome Brick Co., Rome, Ga., have not been able to supply the demand for their pressed brick this season. They are unequalled in the South for rich red color and great strength. They are shipping them to Savannah, Brunswick, Atlanta, and other points in Georgia, and to Birmingham, Bessemer, Anniston, Ft. Payne, and many other places in Alabama. They have a capacity of 100,000 bricks daily, winter and summer, which are burned in Morrison's Improved Kilns.

We are indebted to the Akron (Ohio) Roofing Tile works for a sample lot of their roofing tiles which they now make in a dozen or more different shapes. Their latest, and, we think, handsomest style, is the "Spanish" tile. They are ornamental in form the glazed tiles being a rich dark brown color making a beautiful as well as most durable roof.

Chicago capital has purchased a controlling interest in the Canton (Ohio) Standard Brick Company. The large remodeled iron-sided and iron-roofed six-story mill plant now used for making brick, will be adapted for sewer pipe making, and new brick works, constructed just south of the present kilns, which use oil gas, for burning 200,000 bricks at a time.

The Decatur Tile Co., Decatur, Ill., have made no tile this season but have turned their attention to the manufacture of brick for street paving. They have six round down-draft kilns holding about 38,000 bricks each, and three large square or oblong kilns holding 100,000 each. They are also building another large kiln to hold 100,000. They make an excellent quality of paving brick from common yellow clay.

We call special attention to the advertisement of Mr. B. J. Wilson on page 272 of this issue. Parties having capital to invest would do well to correspond with Mr. Wilson, who, owing to advanced age, wishes to retire from active business, and, therefore, desires to dispose of the right to manufacture his machine to some young, enterprising man, who can give the business the active, earnest attention necessary to insure successful results.

The McLagon Foundry Co., of New Haven, Conn., have favored us with a copy of their 1889 catalogue of their "Brickyard Equipment." It is a large, handsome pamphlet and contains some excellent engravings of their "New Haven" Horizontal Brick Machine with full detailed description of same together with other brick yard appliances. Every brickmaker should write them for a copy, which, we presume, will be sent free of charge.

The Dover Fire Brick Co., Cleveland, O., are building a large paving brick plant at Strasburg, O. They already have large fire brick works at Dover, but the growing demand for good pavers has induced them to build the new plant. They have an extensive bank of fine clay for the purpose and will equip the works with the best machinery and appliances for the work. They expect to be making 50,000 pavers a day by Nov. 1st. The president of the company, Mr. C. S. Barrett, tells us that the brick pavements put down in Cleveland have so far given entire satisfaction. A few blocks laid two years ago shows less wear than the granite pavement laid beside it at the same time. The latter cost $3.15 a square and the brick $1.50.

C. & A. Potts & Co., Indianapolis, are having a remarkable trade for this season of the year. The continued demand for their Disintegrators and Mold Sanders is a surprise to them. They thought that with the fall season business would slacken but orders have continued to come in with very gratifying regularity.

J. W. Penfield & Son, Willoughby, O., report a satisfactory trade. They have been very busy throughout the year, the demand for their machinery has increased steadily till they find it difficult to keep up with their orders though their machine shops and works are equipped throughout with the best modern labor-saving machinery. They are already receiving inquiries for machinery for next season's use and think the prospects are bright for continued prosperity in all lines of clay work and especially in brickmaking which, of course, means a still greater demand for their improved machinery.

The Wallace Manufacturing Company, Frankfort, Ind., report very satisfactory trade so far this season with a very encouraging outlook for the coming year. They have quite recently received orders for machinery for the following points: New York City; Jackson, Mo.; Lucy, Tenn.; Beebe, Ark.; Ironton, Ala.; Louisville, O.; Kingsport, Tenn.; Parkersburgh, W. Va., and Walkers, O., showing that their field is national in character. Their latest success is the Cunningham Automatic Brick Cut-off, which works like a charm. Write them for descriptive circular mentioning the Clay-Worker.

NEW ADVERTISEMENTS.

Lone Star Brick Machine Mfg. Co.,
Brick Press.
Fletcher & Thomas,
Brick Yard Supplies.
Frey-Sheckler Co.,
Clay Working Machinery.
Stedman Foundry & Machine Co.,
Clay Disintegrator.
B. J. Wilson,
International Brick Press.
Brown & Harrop Mfg. Co.,
Brick Machinery.
F. D. Brown and T. D. Ives,
Whittaker Brick Machine.
M. F. Williams & Co.,
Clay Working Machinery.
H. O. Whitney,
Andrus Brick Press.
A. K. Rarig,
Clay Working Machinery.
F. Huetteman & Co.,
Brick Machine.
Jonathan Creager's Sons,
Brick Machinery.
I. & M. Wolff & Coleman,
Brick Driers.
Akron Fire Brick Co.—Fire Brick
G. D. Loud—Pumps.
Cincinnati Corrugating Co.
Small ads., "For Sale, Wanted, Etc."

Stevenson & Co., proprietors of the Fulton Foundry and Machine Shops, of Wellsville, Ohio, are doing a great business just now and getting into shape to do more. The years they have been in business have been sufficient to build for themselves and Fulton Foundry and Machine Shops, a reputation as wide as the continent and excellent as excellence itself. It has drawn orders from almost every state and territory in the Union for their Grinding Pans, Sewer Pipe Presses, etc., and every order filled may be said to have made for them other orders. The scribe looked in upon them Saturday and found everybody busy as bees about their respective work and a full force on. There were numerous and heavy orders on the books, and more arriving every day but they have their business so systematized and their facilities have been so largely increased and improved, that whilst their former despatch was gratifying both to patrons and themselves, now they can largely discount the time formerly required. Their machine shop has been enlarged and some monster planing, drilling and slotting machinery added, which largely increases their capacity and enables to turn out more and better work in a shorter space of time than has been done heretofore.

OUR 1889 CATALOGUE

Is in Printer's hands. Parties desirous of obtaining same will please forward their address at once to insure prompt mailing. Address,

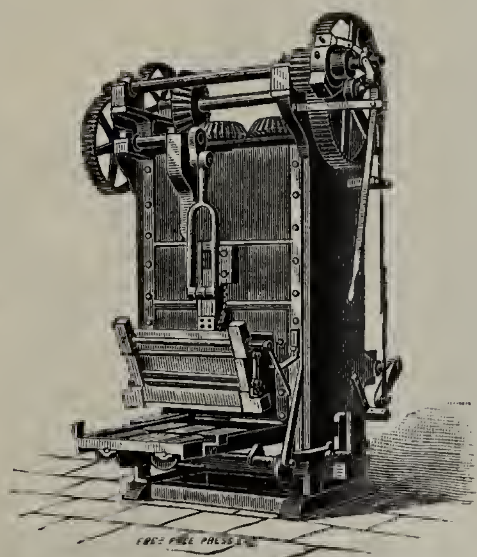
Link-Belt Machinery Co.,
CHICAGO & MINNEAPOLIS,

—OR—

Link-Belt Engineering Co.,
NICETOWN, PHILADELPHIA, PA., &
49 DEY ST., NEW YORK, N. Y.

[Mention the Clay-Worker].

THE DUPLEX BRICK MACHINE.



It is made entirely of iron and steel; strong and durable, has a large square tub, with two grinding shafts revolving in opposite directions which gives it a pugging capacity superior to any other machine on the market. It has a powerful press, adjustable drop table, a very sensitive mould pushing device and safety friction clutch.

☞*Plans for New Yards and entire Outfits furnished and contracted for.*

For catalogue and prices, address

F. HUETTEMAN & CO.,
12 to 16 Sherman St., - DETROIT, MICH.

FOR SALE, WANTED, ETC.

☞Advertising rates in this column 20 cents a line, or 3 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion.☜

FOR SALE OR TRADE. A bargain in a tile factory. Addrsss Lock Box 485,
10 1 d. Sultivan, Ind.

FOR SALE. One set of Clay Rolls.
M. F. Williams & Co.,
1417 N. 2nd St., St. Louis, Mo.

FOR SALE. One steampower sewer pipe press with dies from 3 to 24-in. Also cluster dies for tile from 3 to 7-in. A. O. Jones & Co.,
9 tf. d. Columbus, O.

FOR SALE. Clay land on track; unlimited cash demand for brick in Duluth, St. Paul and Minneapolis. Address F. McNamara,
5 6 c. Little Falls, Minn.

WANTED. A second-hand Dry Press Brick Machine, Andrus preferred. Address
Denver Fire Clay Co.,
10 2 c. Denver, Col.

FOR SALE. One Chambers Brick Machine with engine and boiler complete. For particulars, apply to J. D. Small,
10 5 p w. 1304 F St, N. W., Washington, D. C.

FOR SALE. Bennett Brick and Tile Machine, nearly new. No. 4 Penfield Brick and Tile Machine in good order. Four complete tempering wheels for steam power. Wm. E. Hinchliff,
8 tf d. Room 3, 159 La Salle St., Chicago, Ill.

WANTED. A partner in an established fire front and ornamental brick works in the vicinity of New York City. The location and natural advantages are such as to defy competition. Address Box 220,
8 3 d. Woodbridge, N. J.

WANTED. Proposals for ditching and laying 4-in. tile. Tile to be furnished by owner of land. Four hundred acres to be tiled, the ditches being fifty feet apart. Contract to be let Nov. 1, 1889. For full particulars, address Geo. Hoerty,
10 1 d. 2011 So. 3d Ave., Louisville, Ky.

WANTED, Situation as Superintendent of brick works. 15 years practical experience in the manufacture of brick by dry press or stiff mud process and the building of kilns and burning same for common, paving or face brick. Address G. R.,
10 1 1p. Care Clay-Worker.

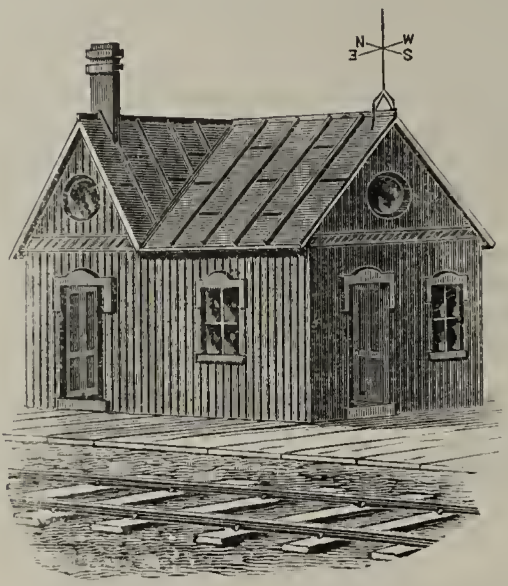
FOR SALE. Fifty shares of stock in the Burlington Brick and Tile Co. The purchaser, if the right man, can obtain a good position as superintendent. For price and particulars and reason for wanting to sell, address M. C. Dawson,
10 1 p 1. Burlington. Wis.

FOR SALE. One New Departure Brick and Tile Machine with pallets and brick dies. One 50 h.p. engine, and boiler with pumps and line shaft belting; complete outfit. Also one Brewer-Tiffany Tile Mill and two roll crushers; one 15 h.p. engine and boiler with pumps, all in good order. B. F. Townsley,
9 tf d. Aledo, Ill.

FOR SALE. One-half of an Oven Kiln Brick Yard, 16,000 daily capacity. Brick cost $5.00 and sell from $8.00 to $10.00. Have poor health—MUST SELL. Price $8,000, one-half cash, balance on time, or will take brick. Possession at once. A million brick sold ahead. James F. Zediker, Box 86,
8 4 c. Grand Island, Nebraska

FOR SALE. One "Titley Screw Press" for repressing brick. Dies for making square, octagon, 4¼" round and 1½" round brick. An entirely new press. After purchasing it other arrangements were made obviating the use of this press, so it will now be sold at a bargan. K. C. Hydraulic Press Brick Co.,
10 p tf. Kansas City, Mo.

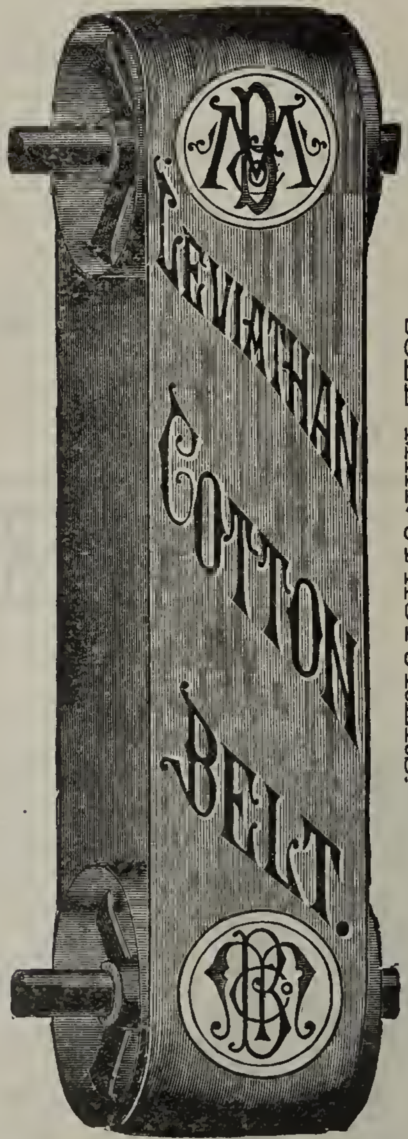
PLEASE MAKE A NOTE OF IT.



The celebrated Patent Edge Corrugated Iron Roofing, sheets having such great lineal rigidity and side joints unapproached for tightness, is manufactured only by

THE CINCINNATI CORRUGATING CO.,

Information promptly furnished. **PIQUA, OHIO.**



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Main Belting Co.,

Manufacturers of the Celebrated

Leviathan Belting!

WHICH FOR

Strength and Traction Power

HAS NO EQUAL.

Specially adapted for Brick and Tile Machinery.

Unaffected by Heat, Steam or Dampness.

Send for Price List.
Samples sent on application.
Mention this paper.

FACTORY AT PHILADELPHIA.

Address,

Main Belting Co.,

248 Randolph Street, Chicago, Ills.

Note—To any responsible party sending us measures, we will ship a "Leviathan" Belt on sixty days trial; to be paid for if satisfactory.

SEE THE BATTLE OF ATLANTA.

Market St. Between Ills. St. and State House, Indianapolis.

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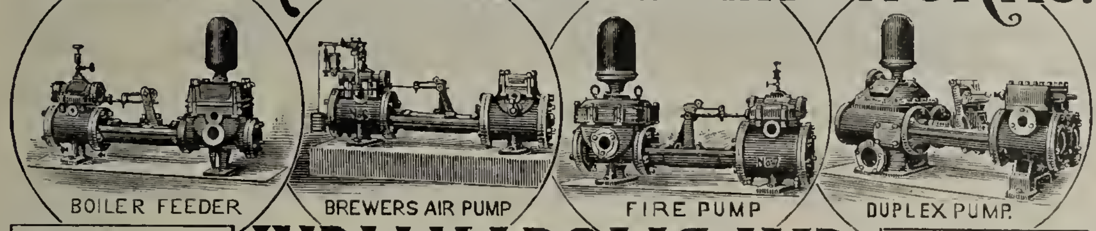

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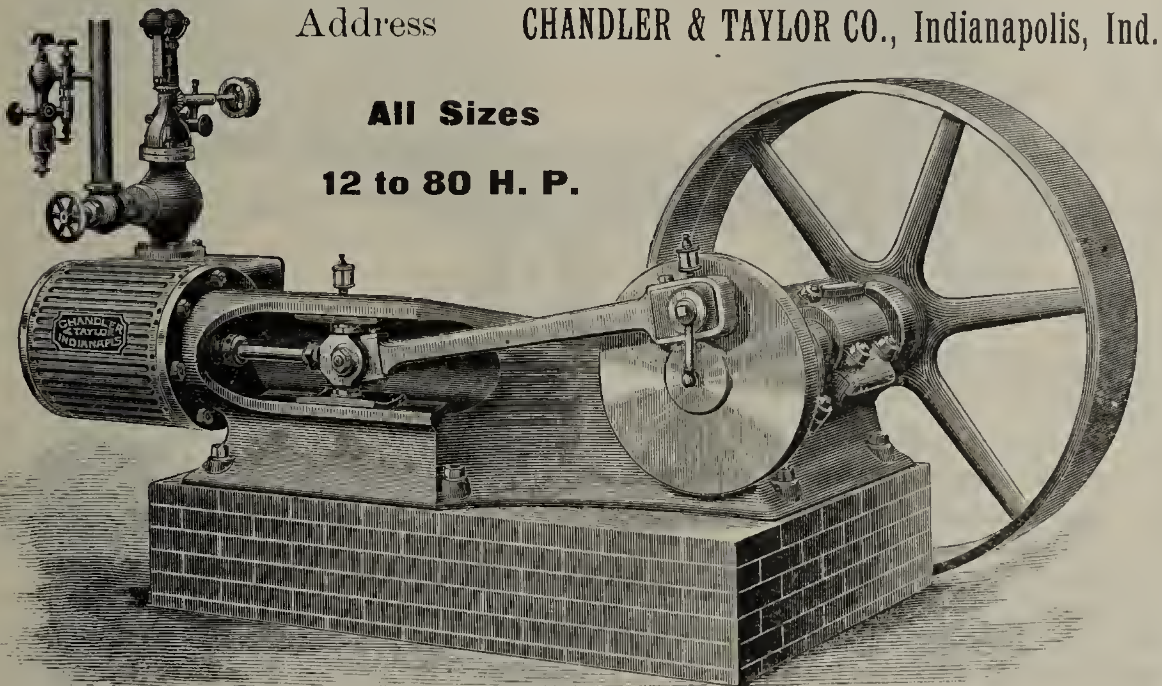
INDIANAPOLIS. IND.
SEND FOR CATALOGUE AND PRICES.

STRONG, WELL BUILT, SERVICEABLE.
STEAM ENGINES
IN STOCK FOR QUICK DELIVERY.
Every Engine Tested Under Full Load Before Shipment.
Address CHANDLER & TAYLOR CO., Indianapolis, Ind.
All Sizes
12 to 80 H. P.



STEAM ENGINES!
Upright and Horizontal,
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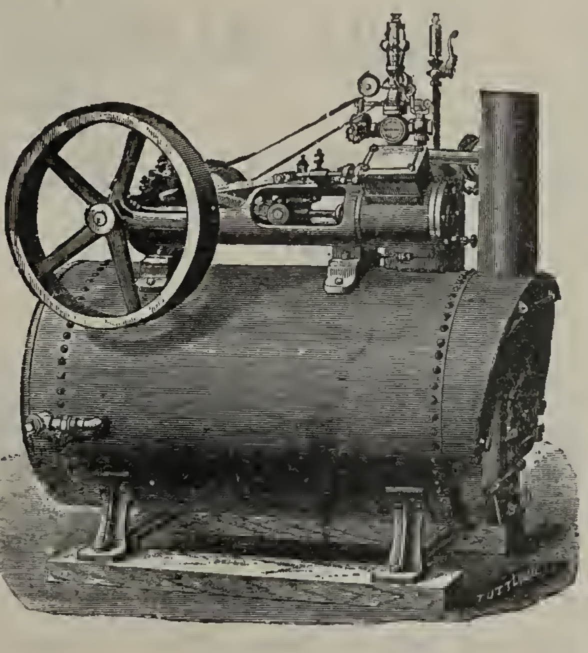
and Semi-Portable.

All sizes, from Three to Twenty-six Horse-Power. Compact, Substantial, Economical and Easily managed. Guaranteed to Work Well and give the Full Power Claimed. Over 4,000 in Successful Operation. Not One Ever Exploded. No Engine Built so Well and so Low in Price. Illustrated Pamphlet Free. Address,

JAMES LEFFEL & CO.,
Springfield, Ohio,
Or No. 110 Liberty St., New York City.



FOR LALE, at Tampa, Fla. Brick factory, 40 acres of land, only clay found within 40 miles; 16 h.p, engine, 100 M shed room, Chief Brick Machine, capacity 20 M. Pallets, sheds, cars, barrows and tools. River transportation. Tampa is the coming town of Florida. Cause of selling, other business.
WM. A. MORRISON,
10 3 c. Tampa, Fla.

SUPERINTENDENTS WANTED for dry pressed brick works. We are planning and fitting up at the present time about twenty brick plants with the Boyd Semi-dry Brick Press. Several of these are new yards. We will want foremen or superintendents. Parties desiring such positions will kindly write us fully, giving us references, experience they have had, etc., etc. Correspondence confidential if desired.
CHISHOLM, BOYD & WHITE,
10 tfd. 93, 94 and 95 Adams' Ex. Bldg, Chicago.

WANTED. The undersigned, who controls a large deposit of clay suitably situated for the N. Y. market and admirably adapted for manufacture of brick by the *dry process* as demonstrated by tests, is desirous of entering into negotiations with an expert in the methods and machinery of making brick by the *dry process* who is willing to take an interest in the business and the property in return for his services in promoting the enterprise. WM. F. CHITTENDEN,
9 1 3p. 112 Decatur St., Brooklyn, N. Y.

FOR SALE. 2 Adrian Brick and Tile Machine Cos' brick machines, 2 Frey, Sheckler Cos' Cut-off Tables, cut 13 brick at a time. These machines have been in use only 3 months and are all good as new. I have four outfits like this and am going to run only two of them on account of dry room. A lot of 3-in. shafting, several large pulleys, belting; large first-class engine, 75 h.p., large boiler, two steampower hoisting drums for hoisting clay to machinery. All are new and in first-class condition. Will give a bargain if sold soon. We make pressed brick on these machines that we get $18 per M for. Address F. G. LOTTERER,
10 3 d. Fort Scott, Kan.

AGENTS $1,000 Per Year and Expenses is what we are paying. We want 100 more and will pay Salary and Commission from start. A Rare Opportunity for any man wanting a position as Local, Traveling or General Agent for a reliable Nursery that guarantees its stock. Address at once McMANAMON & LUETCHFORD,
Nurserymen, Rochester, N. Y.
10 3 t. Mention this paper.

The Patent Hale Pavement

Is the best and cheapest Roadway now in use for cities and towns. It is more durable than granite or asphalt and costs much less.

Descriptive pamphlet sent on application. Correspondence solicited.
Address
CHARLES CATLET,
Gen. Manager. STAUNTON, VA.

CALIFORNIA EXCURSIONS.

Something New! Pullman Tourist Sleeping Cars on Second-class tickets.

The trip can now be made more comfortably than ever before.

If you contemplate a trip to the Pacific Coast this fall or winter write at once for circulars, maps, etc., giving full information about the "*Santa Fe Route*" and their *Popular Weekly Excursions*. Persons purchasing either one way or round trip tickets can join these excursions. Address, F. T. HENDRY, Passenger Agt., A. T. & S. Fe R. R., No. 0 Jackson Place, Indianapolis, Ind.

Mention the Clay-Worker
When writing to Advertisers
Mention the Clay-Worker

AKRON FIRE BRICK CO.,

MANUFACTURERS OF

FIRE BRICK.

ALL SIZES AND SHAPES.

FOR

SEWER PIPE, TILE

AND

STONEWARE KILNS.

Also Ground Fire Clay for Mortar.

Having made the special shapes necessary for this work a study, we have mainly intended to lessen the mason's labor and at the same time produce a better construction of the work. Address

B. M. ALLISON, Sec.,
SIXTH WARD, AKRON, OHIO.

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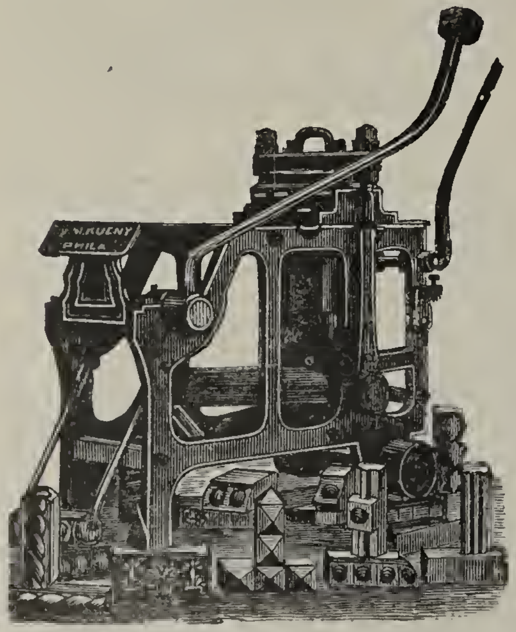
MANUFACTURER OF

BrickPresses



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Pennington Ave. and Reservoir Street,
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Horse & Steam Power Brick and Tile Machines.
Pug Mills, Moulds, Trucks Barrows, &c.
Steam Engines and Boilers, Shafting Gearing, &c.
Castings, Repairs and Jobbing.

Send for Illustrated Catalogue of Brick and Tile Machines and Brick Makers' Appliances. Address,

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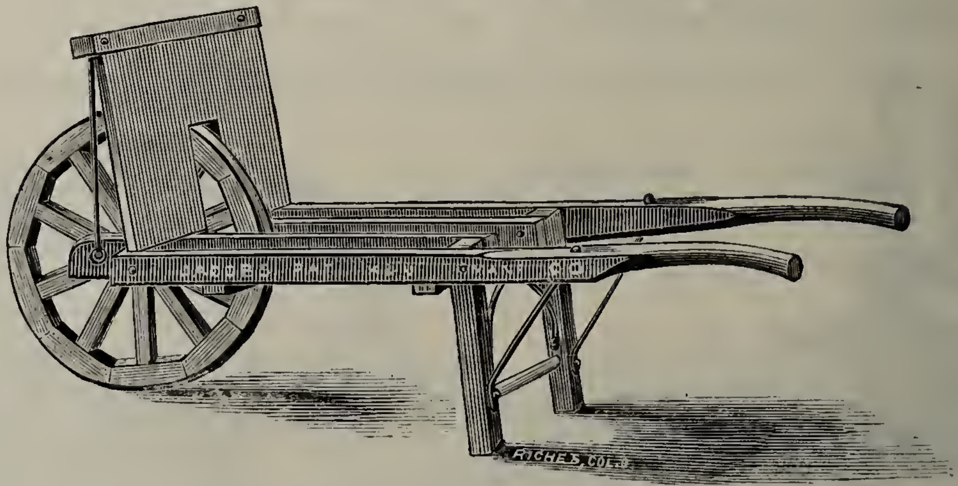
The Kilbourne & Jacobs Manufacturing Co.,

LARGEST MANUFACTURERS IN THE U. S., OF

Bolted Brick Barrows, Mule Trucks, Spring Brick Trucks, Road Scrapers, Wheel Scrapers, Grading Plows,

AND BARROWS OF ALL KINDS.



Open Bottom Brick Barrow, with Jacob's Patent Wood Wheel

Handles 52 inches long; Legs 17 inches high; Bottom 23½ inches wide, 29 inches long; Dash, 24 inches wide, 19½ inches high.

This Barrow is designed for use in Brick and Tile Yards, and especially for handling green brick. Diameter of Wheel 19 inches; width of Tire, 1¾ inches.

These Barrows fold for shipping same as our Garden Barrows. ☞Send for General Catalogue.

THE KILBOURNE & JACOBS MFG. CO. - - Columbus, Ohio.

EAGLE MACHINE WORKS MFG. CO.,

MANUFACTURERS OF

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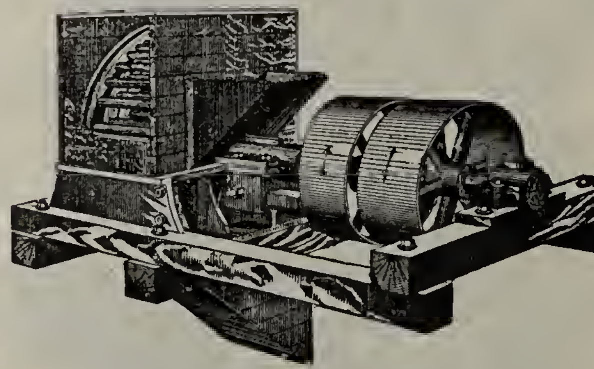

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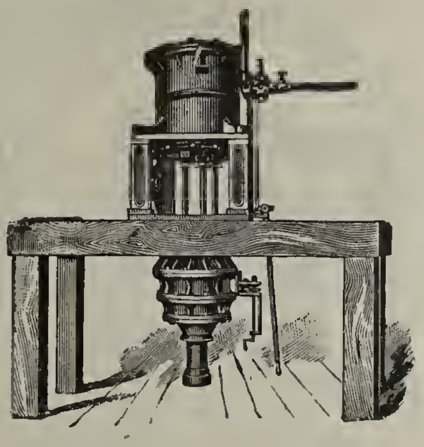

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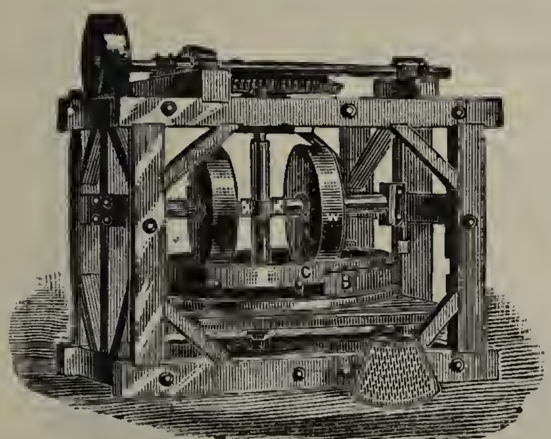

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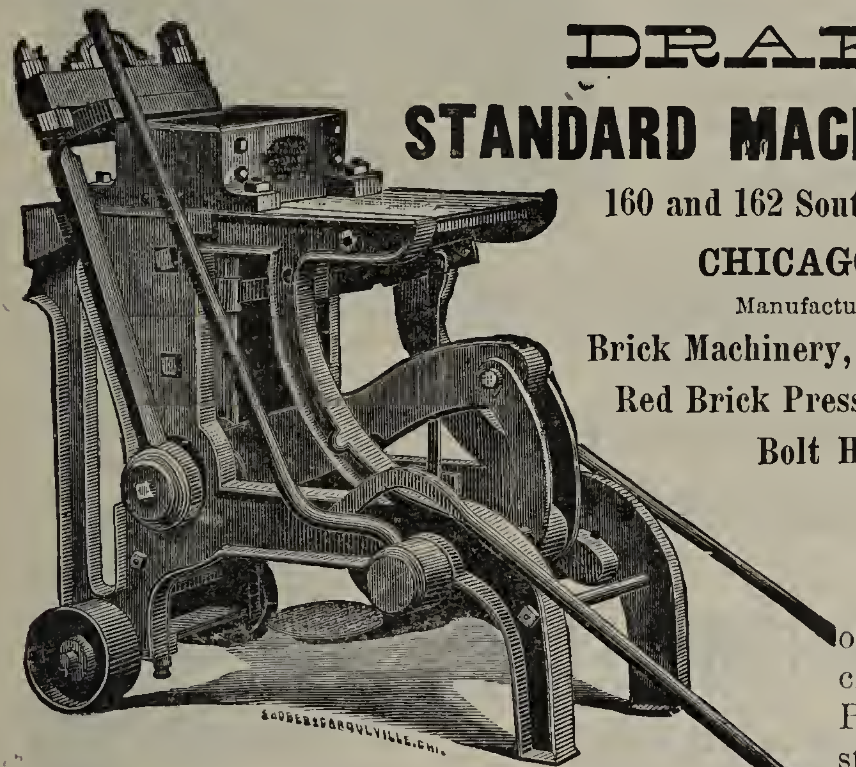
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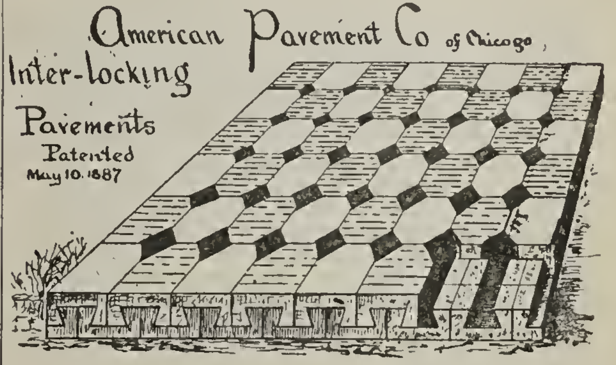

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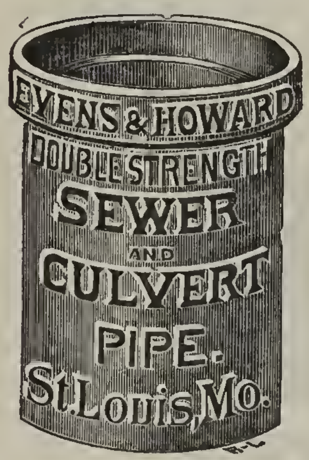

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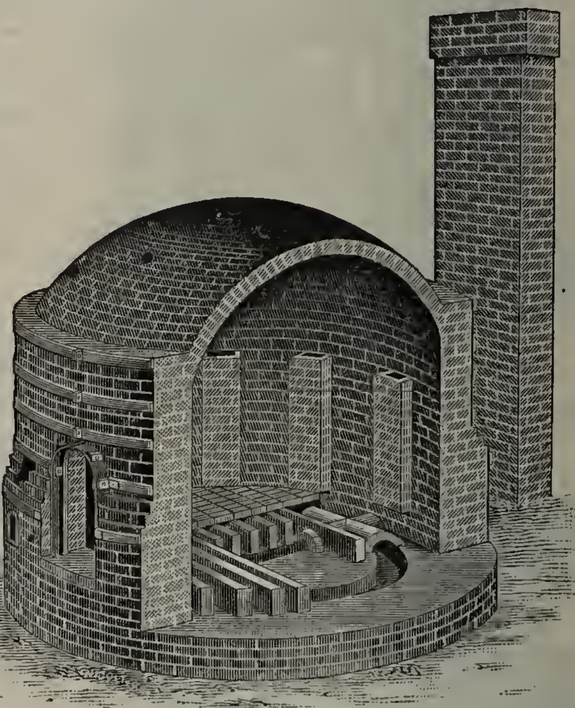

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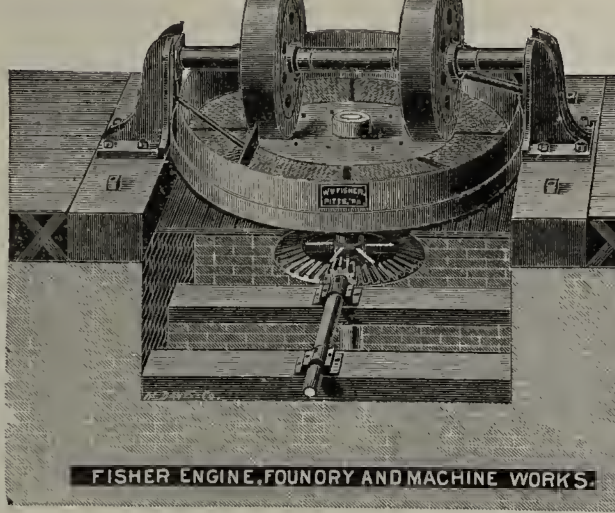
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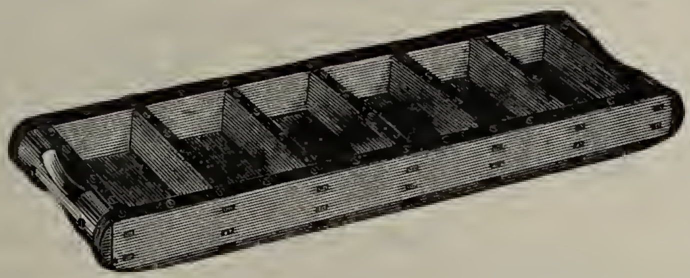

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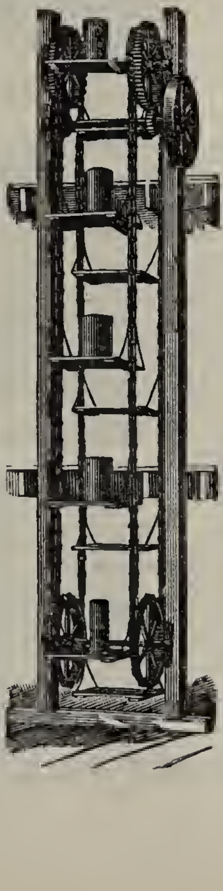

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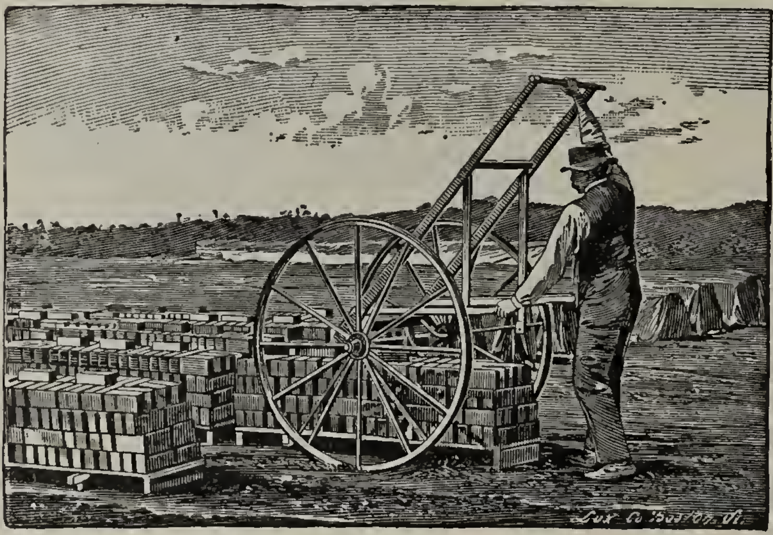

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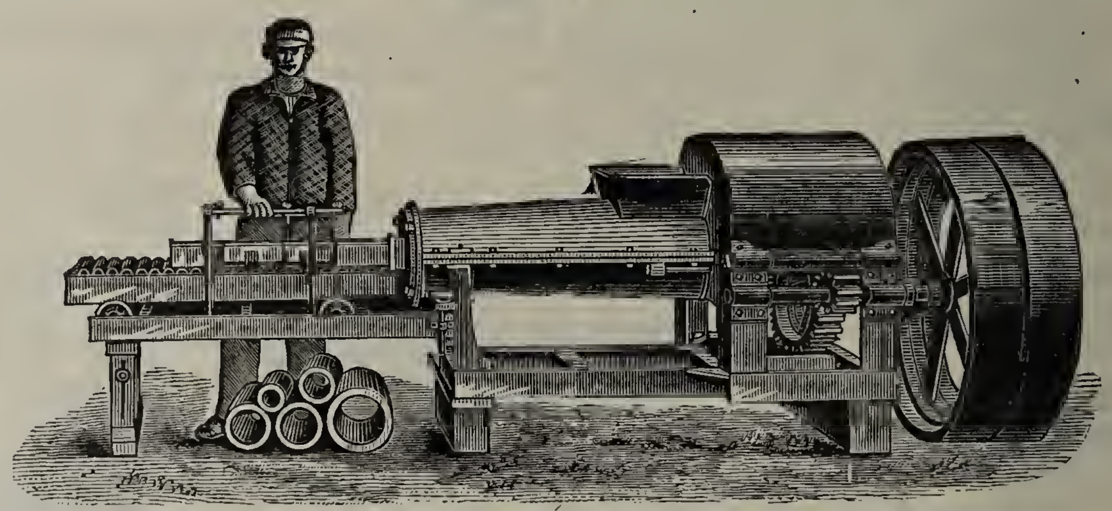

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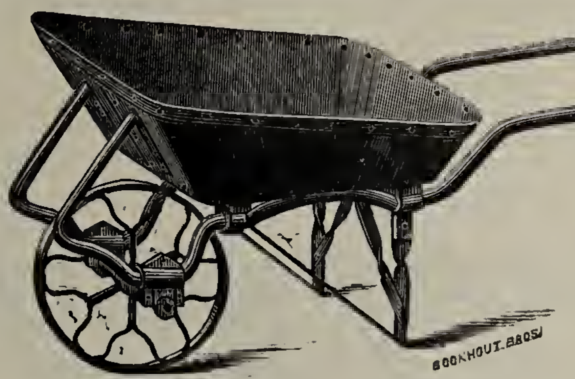
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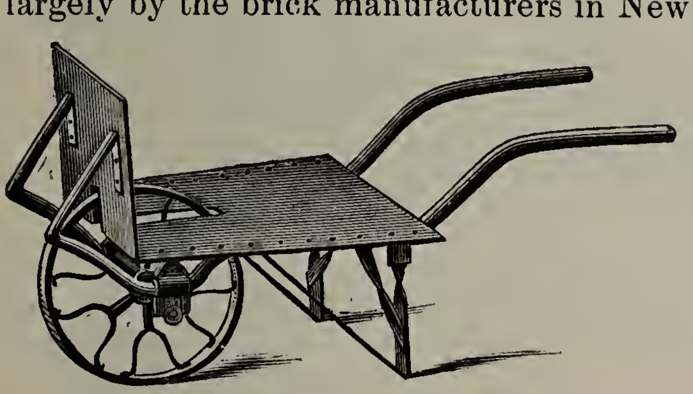

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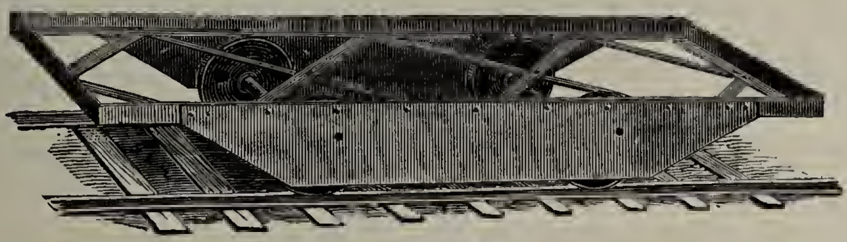

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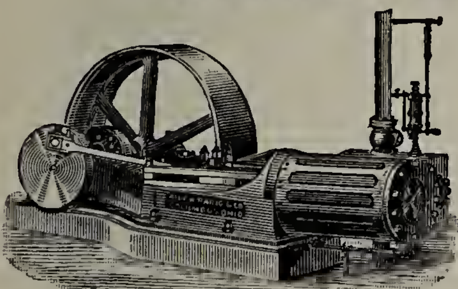

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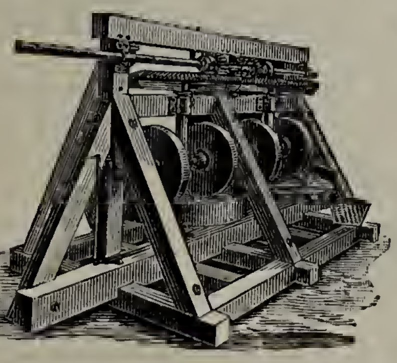

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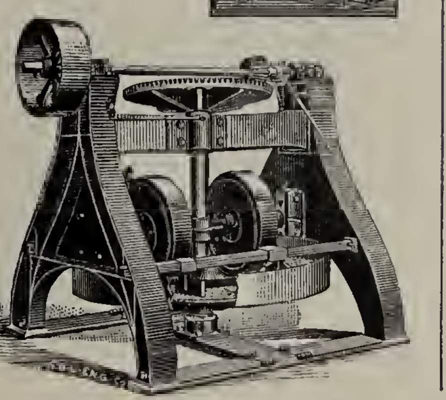

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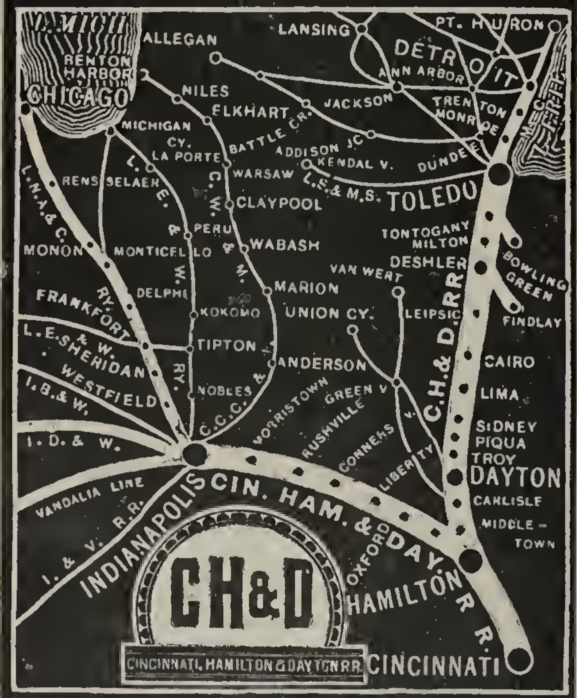

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Combined in Our Machine—Built Especially for Brickyard use.

BARNHART'S $\frac{3}{4}$-YARD STEAM SHOVEL.

Our experience with this class of work enables us to offer the best on the market. Our $\frac{1}{2}$, $\frac{3}{4}$ and 1 yard shovels are especially suited to the excavating of clay for brickyards.

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THE MARION STEAM SHOVEL CO., MARION, O.

Also manufacturers of Steam Shovels, Railroad Ditchers, Dredges and County Ditchers for every kind of excavating. All machines sold subject to guarantee in catalogue, to which we would respectfully ask the attention of all who receive it.

Grant & Murray's Improved Brick Machine.

In placing this Improved Machine before the public and setting forth what we claim for the merit of the machine, we guarantee to fully verify in the practica operation of the machine.

This process of brickmaking has been thoroughly tested and has proven to be a perfect success, and is as cheap a process as any on the market. The machine is constructed wholly of iron and weighs upwards of twenty thousand (20,000) pounds. It is simple and durable. The operation of it is easily understood. Its capacity is two thousand (2.000) brick per hour. The brick are far superior in strength and finish to common brick. The clay is worked at a consistency that under pressure deposits the greatest amount of clay in the brick, giving them great strength and thereby making them especially adapted for street paving purposes. In actual tests where there has been the strongest competition there has not been a brick submitted that would stand near the pressure, absorb as little water, or stand the wear by friction as these brick.

If Brickmakers or those that are going into the business will send us a barrel of their clay we will fully demonstrate the quality of the brick in this respect.

Not having sufficient capital we desire to dispose of an interest in the patent and business generally to some one, or company that would have sufficient capital to push the manufacture and sale of this machine as the merit of it would justify or demand.

We ask the attention of manufacturers desiring a specialty to the above, with a view to the manufacturing of the machines.

Machines can be furnished on short notice. Correspondence solicited. For further particulars, prices, etc., address

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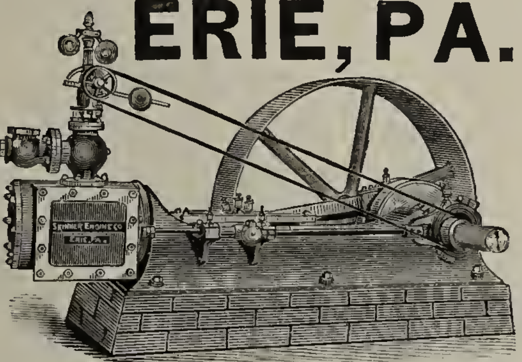

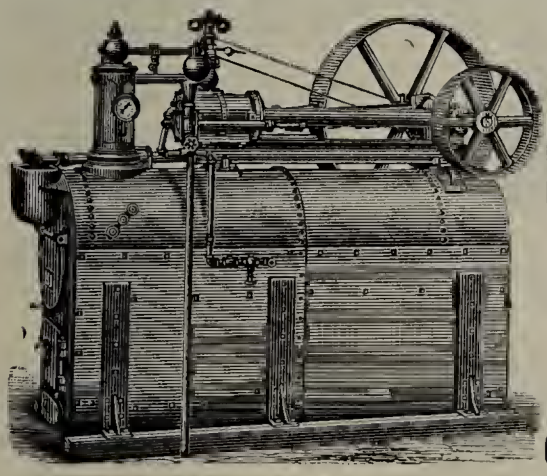

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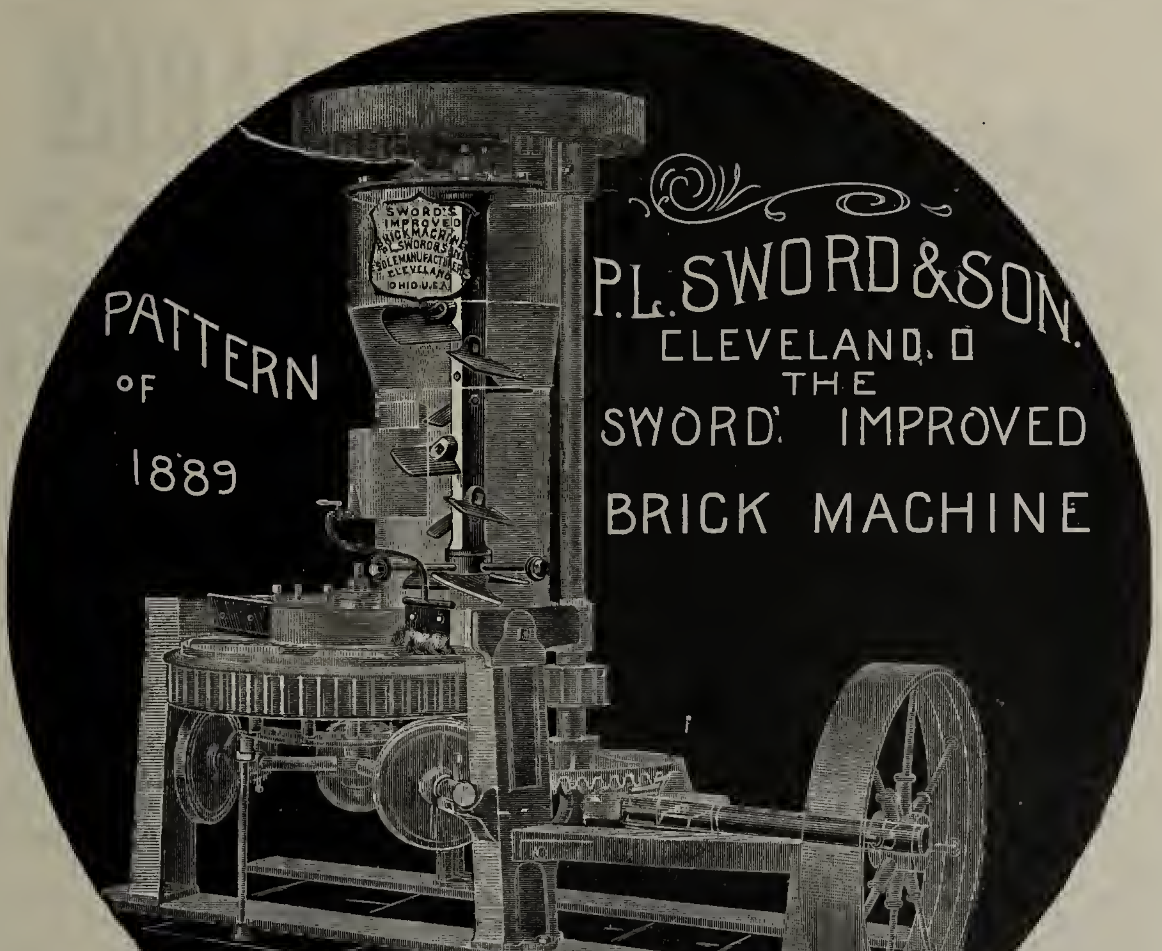

To Brick and Tile Burners

CRUDE OIL AS FUEL FOR THE FIRING OF KILNS OF ALL KINDS WITH THE MITCHELL COMPRESSED-AIR OIL BURNER.

Within the past year we have applied our Air Burner to Brick Kilns for the burning of brick with crude oil as a fuel, and the results have been so very satisfactory that we are warranted in now offering our burner as the most successful one for this purpose, as well as for most others.

We are now prepared to fit out kilns of any size, and can assure customers that they will be satisfied with the apparatus. The advantages of our burner over all others are many and result from the use of compressed air for the operation of the burner in place of steam, which is used in all other burners.

The advantages may be stated as follows:

1st. Our fire is always under complete control.

2nd. Our burner remains lighted with a small fire, in a cold, damp arch. No steam burner, that we know of, will produce a sufficiently small and gentle fire for the early stages of brick burning.

3d. We require no specially constructed furnace or kiln. We can apply the burner directly to the arches without furnaces, or to any style of furnace.

4th. The drying off process is much more quickly and cheaply accomplished with our burner because we avoid blowing out steam into the bricks; we use only air.

5th. We make a saving of from two to three days in the time required to burn a kiln.

6th. It only requires one man to each shift to attend to the entire kiln.

7th. Our burner does not crack or melt the arches and yet it burns the kiln hard to the top course.

8th. The fire set at any desired strength in an arch will remain at that strength until altered by the operator.

It is useless to attempt to state the time required to unrb a kiln, or the amount of oil needed, because clay differs greatly in different localities; bricks are set to different heights, and bricks are burned to different degrees of hardness and the amount of fuel required varies accordingly.

To burn the whole kiln into good, hard bricks with average clay will require about one barrel or 40 gallons of crude oil per thousand brick; or 40 gallons of oil about equal 10 bushels of good Pittsburgh coal.

Upon investigation, you will find that this is better than is done by any other burner, and for the advantages as mentioned above, you will find our burner to be in every way superior to all steam burners.

We have fitted up the Cincinnati Brick Co. yards near Addyston, Hamilton Co., Ohio, on the C. I. St. L. & C. Railway, (Postoffice address, Johnston Building, Cincinnati, Ohio) and that Company has burned about two and one-half million brick with our apparatus. Anyone will be welcome at their yard to see the burner in operation, and the foreman, Mr. A. C. Spahr, or the Company will give all the information desired. In the case of this Company, we run not only the kilns, but the boilers and all the machinery on the place. For terms and information, address

Mitchell Compressed-Air
Oil Burner Company,
P. O. Box 188,
CINCINNATI, - - OHIO.

JUST PUBLISHED.

Tables of Analyses of Clays, Etc.

Showing the composition of all the principal clays in Europe and America, a book for all interested in clays and their products. Compiled and arranged by Alfred Crossley. Price, One Dollar. Postage Paid.

Extracts from the Author's Preface—Every clay owner should know all about his clay if it is of any value, and one of the first steps to a full and correct knowledge of clay is to have it subjected to a chemical analysis. But it is not enough for a man to know his own clay, he should also acquaint himself with the properties of other clays. and in fact, by his very knowledge of others he will be the better able to judge of the value or otherwise of his own. This little book is intended in an humble way to supply that knowledge. In it will be found the analyses of the best known and most celebrated clays of the Old and New World, with many others of lesser note but in some cases, of equal quality. * * * To each analysis, as far as known, I have appended a remark as to the character of the goods actually made from it. This, I apprehend may be useful as affording a clue to what line of manufactures other clays of like character may be very properly applied. * * * To make the book more useful to the practical man, I have added some blank space at the end, ruled and headed, so that parties can fill in the analysis of their own clay and any others in which they may be interested.

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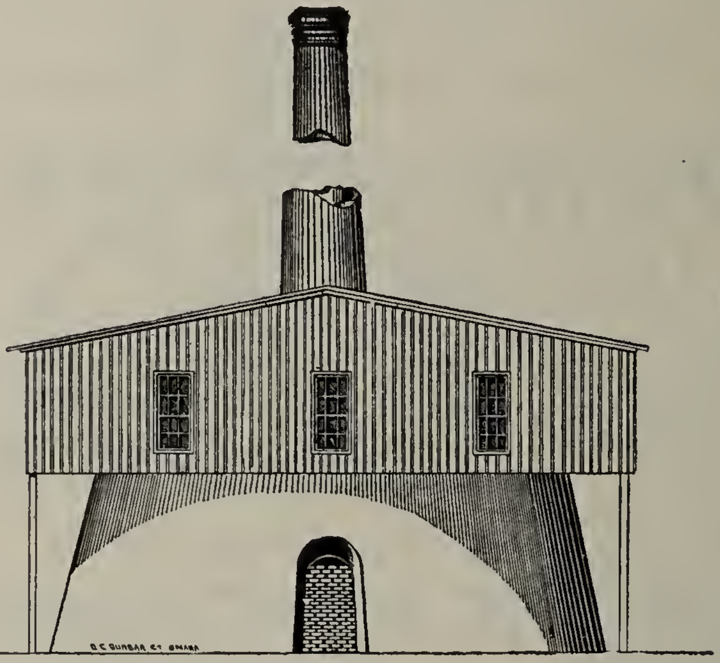
T. A. RANDALL & Co.,
Pub's "Clay Worker," Indianapolis.
Or by the author, A. CROSSLEY,
Chattanooga, Tenn

THE CONTINUOUS KILN CO.,

1110 Farnum Street, Omaha, Neb.

C. F. GOODMAN, Pres. and Treas. F. D. COOPER, Secretary.
MAX. A. TH. BOEHNCKE, Superintendent.

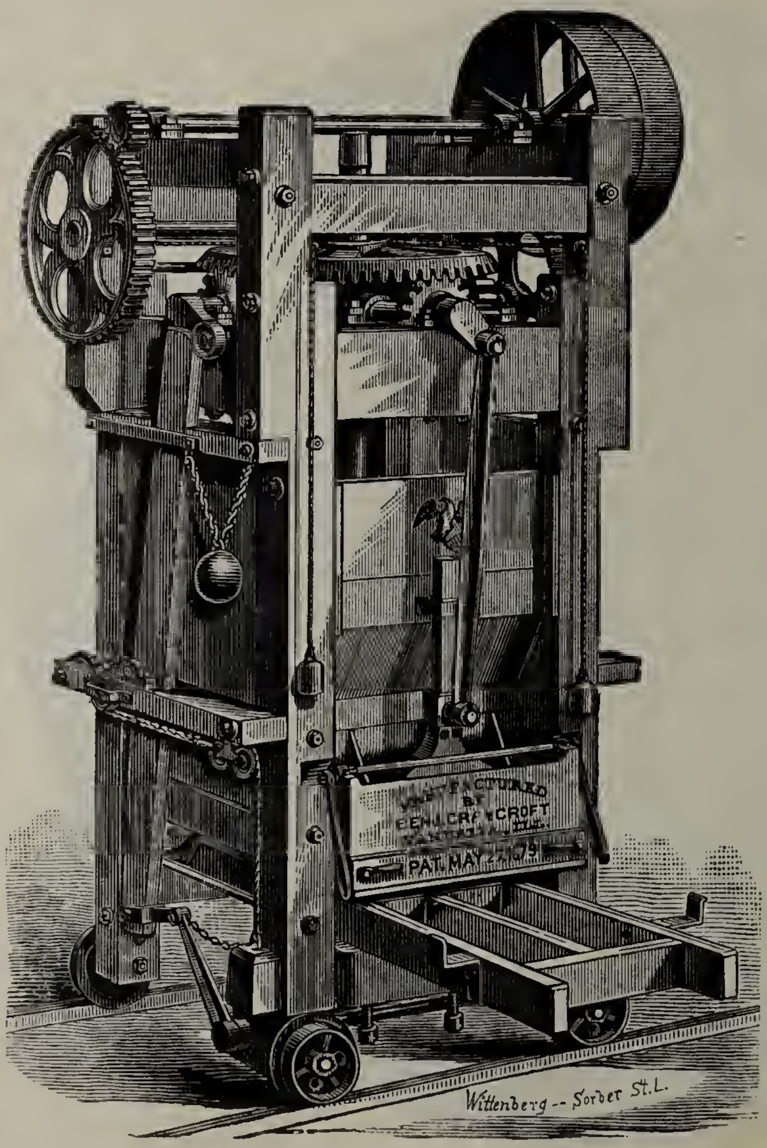


We invite the attention of all brickmakers to our improved method of drying and burning brick.

Our **Combined Dryer and Kiln** patented January 8, 1889, should be investigated by all who are seeking more economical methods. By its use the following advantages may be obtained:

Eighty per cent. fuel saved.
A Perfect Result from any Fuel.
No Loss in Burning.
All Uniform in Color and Quality.
Brick Burned in Winter as well as Summer.
Expenses for Repairing Small.

Write for descriptive circular and full particulars. (Mention Clay-Worker.)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BRICK
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Steam and Horsepower.

THE BEST MACHINE IN THE MARKET.

The Horsepower Machine will make 17,000 to 20,000 brick per day; the Steam-power Machine, 25,000 to 30,000.

These Machines are sold on their merits, guaranteed to do first-class work.

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Vandalia, Ills.
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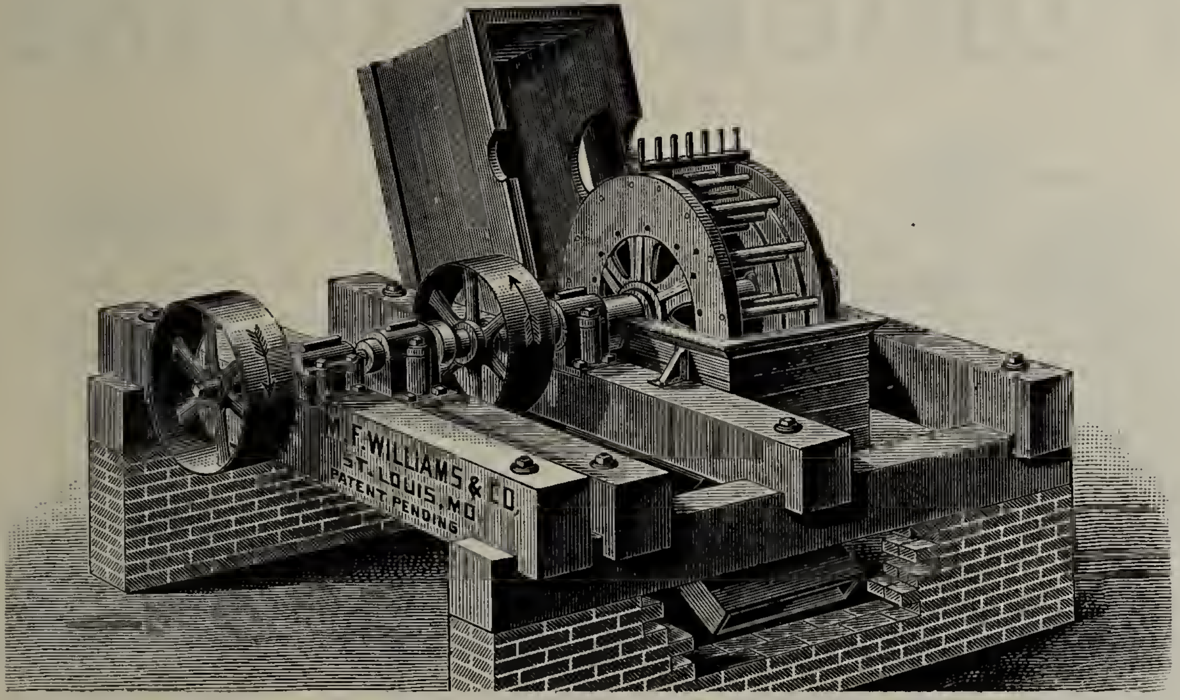
Williams' Cyclone Clay Pulverizers.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WILLIAMS' Cyclone Pulverizers, 36, 40 and 48-in. diameter.
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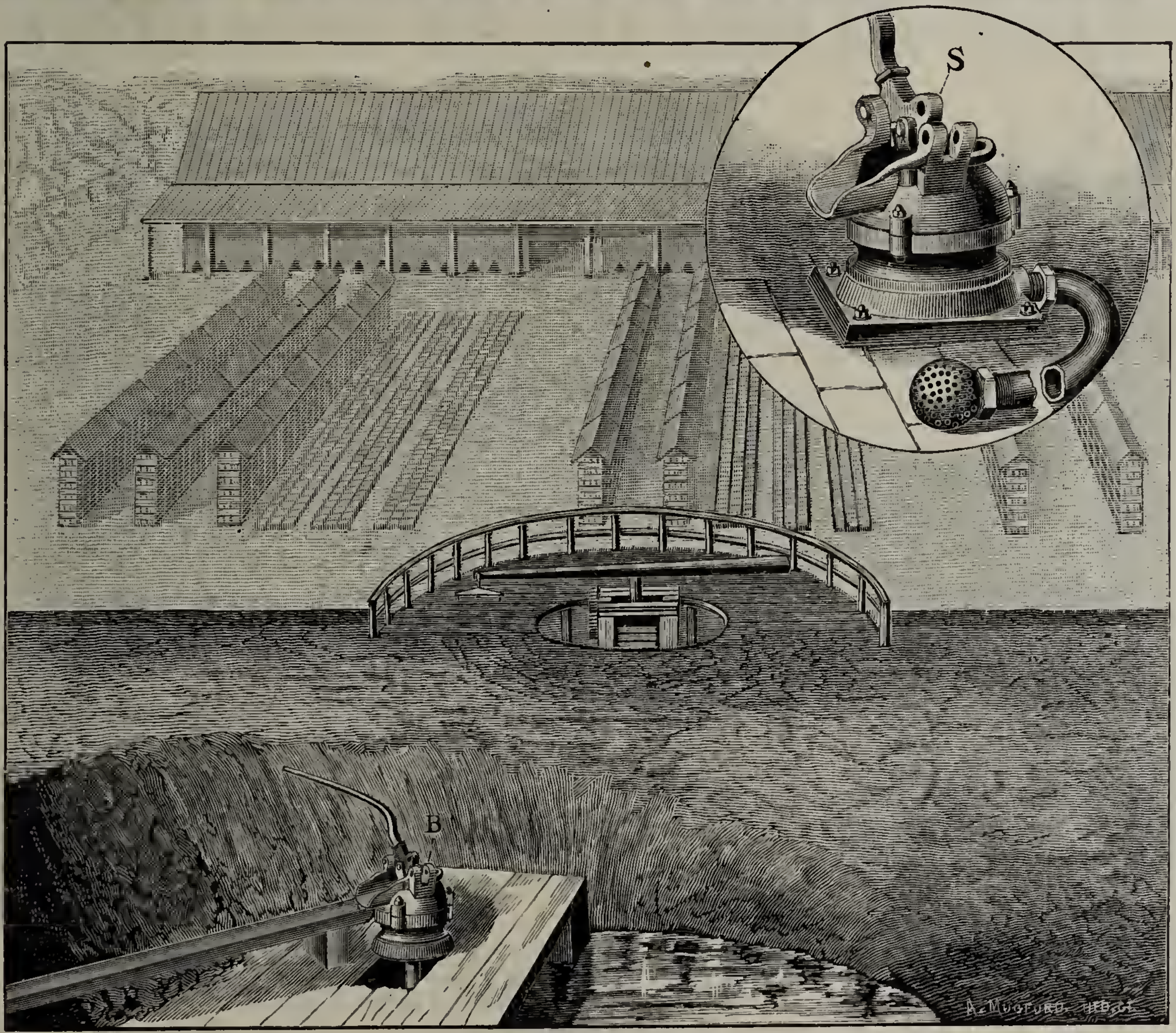

A large capacity Pump for Brick-yard use.

Will pump water co taining sand, gravel, mu etc., without perceptibl wear.

Capacity, 3,500 to 4,000 gallons of water per hour by hand power.

These pumps will be sent on 30 day's trial to responsible brick makers.

Every brickyard should have one of the large capacity hand pumps for emergency.

Price of pump for Side Suction Connections marked in cut S, $26.00.

Price of pump for Bottom Suction Connections marked in cut B, $24.00.

A discount of 15 per cent. will be made from the above prices for the next 60 days.

These pumps are constructed under the supervision of the Inventor,

Geo. D. Loud,
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Room 78 Mason Bld'g.

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SEMI-DRY BRICK MACHINE

[Patented in U. S. May 13, 1884.]

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For territory west of Mississippi River.

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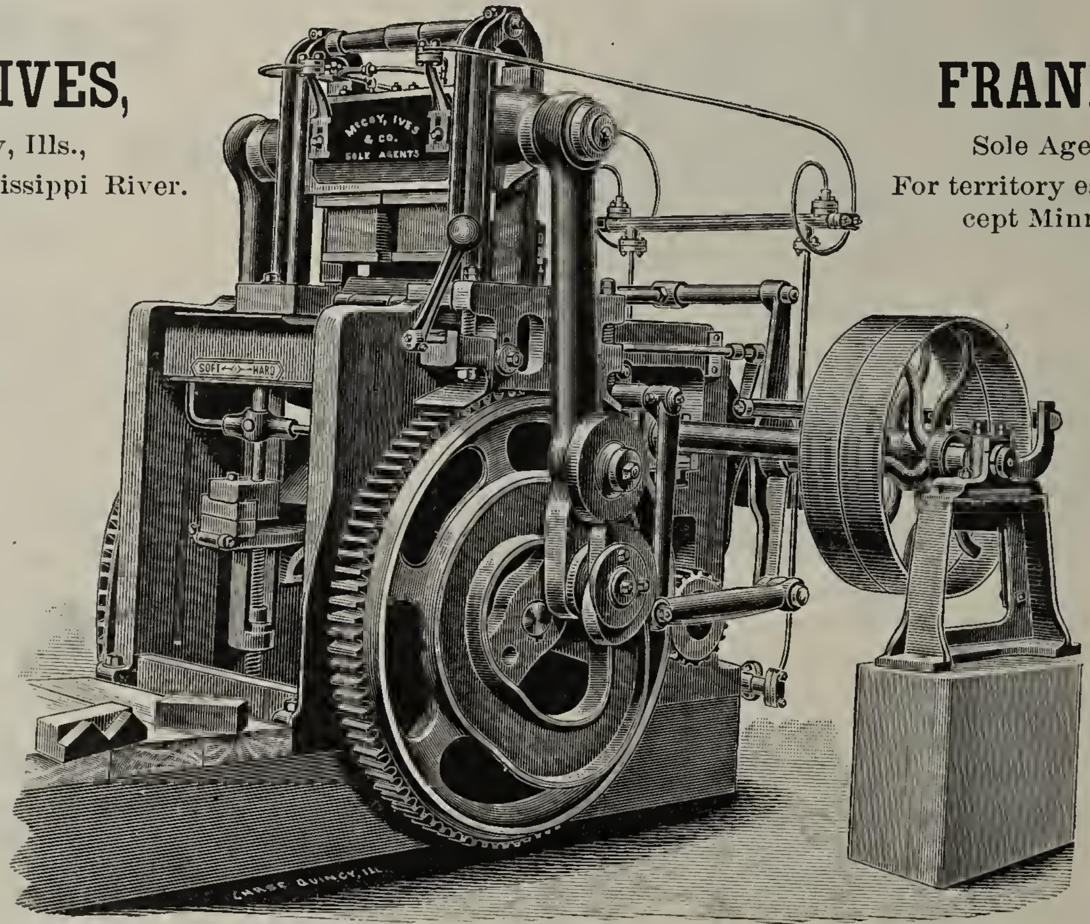
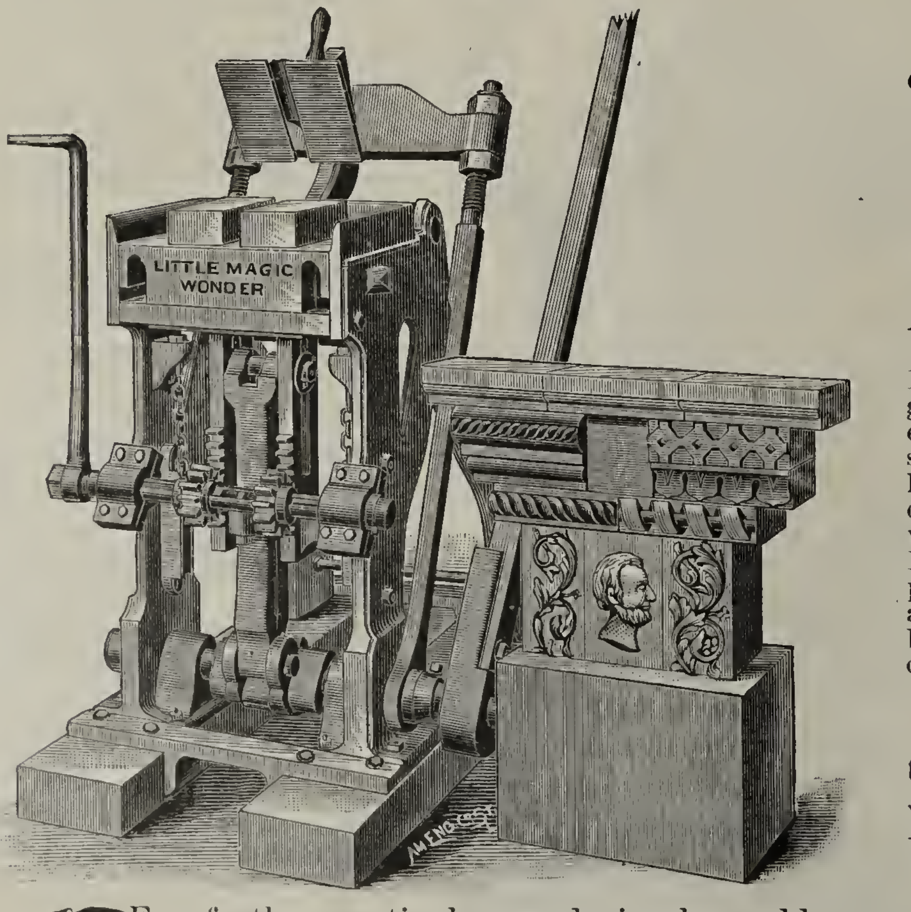
For territory east of Mississippi River, except Minnesota and Wisconsin.



THE ONLY PERFECT BRICK MACHINE MADE.

The LITTLE MAGIC WONDER



It Will Do It!

Over 1,000 Different Patterns of Ornamental Bricks Can Be Made on this Wonderful Press.

Hear What a Prominent Brickmaker Says:

St. Louis, Feb. 3d, 1889.

Mr. Wm. Thaison, Austin, Texas:

DEAR SIR—At the end of a fair and satisfactory trial of your Little Magic Wonder Dry Clay Hand Brick Press, it affords me great pleasure to testify to its efficiency for the purpose intended. I had long been looking for just such a Press, whereon at short notice and at very slight expense we could, within a few hours' time get out small orders for ornamental bricks of special designs and patterns without interfering with the operation and working of our regular machines. The great value of your Hand Press to me, lies in the fact that we can make bricks upon it by pressure on edge as well as flat wise, thus enabling one to make almost any conceivable design of fancy moulded ornamental bricks. As you let your machines go out on trial there can come no loss to parties intending to purchase.

Very Respectfully, ANTHONY ITTNER.

Mr. Ittner runs two of these machines. His reputation as a gentleman and an expert brickmaker is so well and favorably known to the readers of the Clay-Worker that further comment is unnecessary.

☛ For further particulars and circulars address

Lone Star Brick Machine Mfg. Co.,
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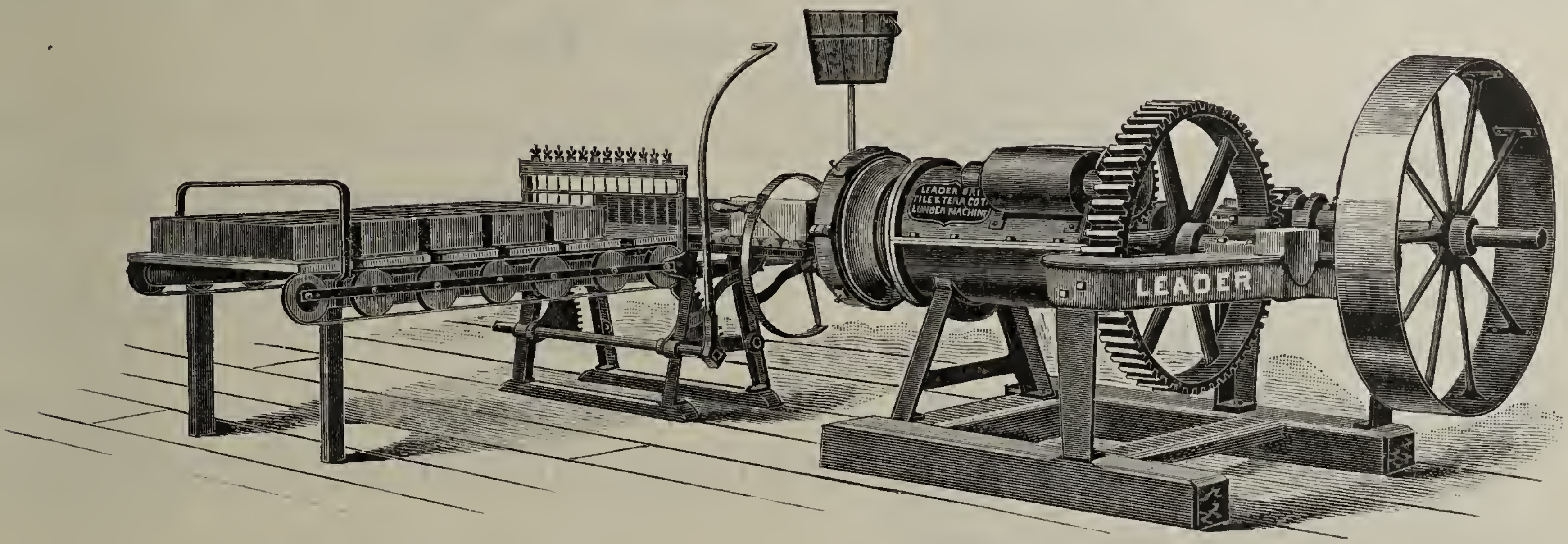
THE LEADER BRICK MACHINE.

WITH SELF DELIVERY TABLE AND LUBRICATING DIE.


LEADER BRICK TILE & TERA COTTA LUMBER MACHINE
LEADER

We manufacture the latest and most approved designs of machinery for making Brick and Tile. Also a complete line of Clay-working Machinery, Clay Crushers, Elevators, Dump Cars, etc.

Circulars free. Correspondence solicited.

BROWN & HARROP MFG. CO.,

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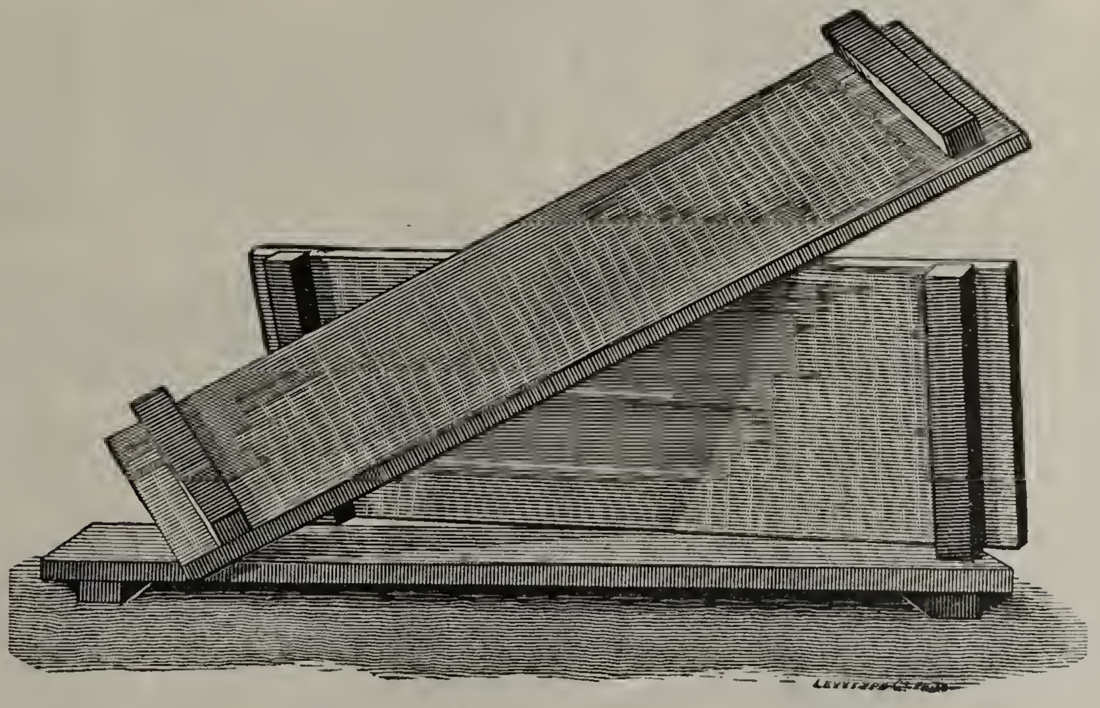
BRICK PALLETS.

Brick Pallets.



Brick Pallets.

PIPE BOARDS, ROOFING LUMBER Supplied Direct in Carload Lots.

When writing for prices, give an exact description of the kind of pallet wanted, as different pallets are in use in different sections of the country. State whether cleats are to be nailed on; also length, width and thickness of the pallet. We have a big trade in this line and can save you one profit. Write for prices.

W. B. MERSHON & CO.,

Manufacturers of all kinds of white pine lumber and packing boxes in shooks.

East Saginaw, Mich.

→ THE STANDARD BRICK MACHINES ←

—MANUFACTURED BY—

A. M. & W. H. WILES,

Grassy Point, Rockland County, New York.

These Moulding Machines have been in constant use for over 30 years, and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

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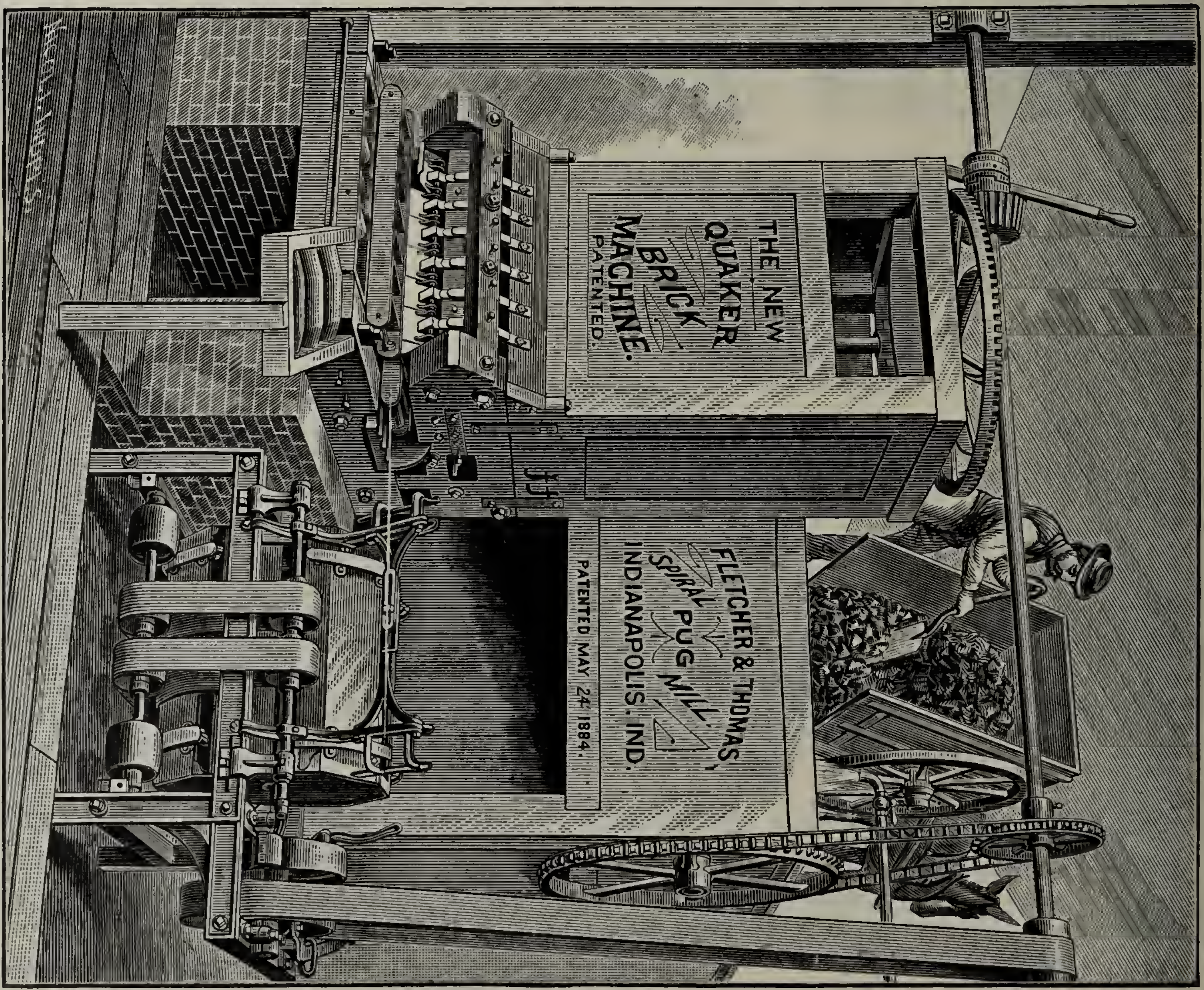
CORRESPONDENCE SOLICITED.

This outfit will make the largest number of the very best of Pallet Bricks at LeastCost of anything in the market. For further particulars address


THE NEW QUAKER BRICK MACHINE. PATENTED.
FLETCHER & THOMAS, SPIRAL PUG MILL INDIANAPOLIS, IND.
PATENTED MAY 24th 1884.

BENNETT BROS. & CO., Wellington, Lorain Co., Ohio

H. Brewer & Co's. Clay Crusher and Stone Separator.

The prominent feature in this Crusher is the combination of two smooth, tapering crushing rolls, running at different speeds, in connection with an adjustable transverse roll which is of irregular form and provided with teeth or spurs, whereby the clay is rapidly broken up and crushed, and the stones separated therefrom.

TESTIMONIALS.

Saunemin, Ills., May 18th, 1888.

H. Brewer & Co., Gentlemen—Your Crusher works to a charm and we are very highly pleased with it. It runs one-half easier than any other Crusher we have had.
Yours Truly,
SAUNEMIN BRICK AND TILE CO.

Budd, Ills., May 3d, 1888.

H. Brewer & Co., Dear Sirs—The Crusher and Elevator work to my entire satisfaction. I feel confident I would be $2,000 ahead, to-day, had I put in your Machine and Crusher at the start.
Yours Truly,
HENRY SIEDENTOP.

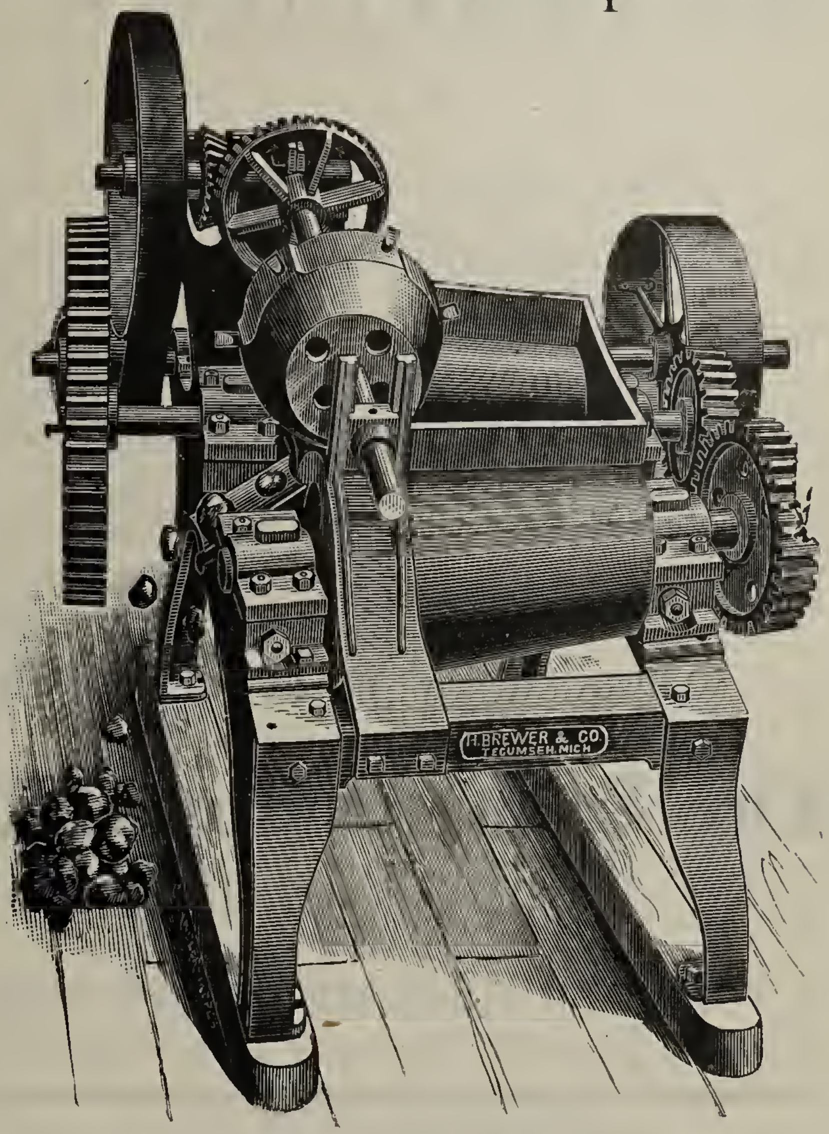
Monroe, Iowa, May 15th, 1888.

H. Brewer & Co., Gentlemen—The Crusher is giving good satisfaction and I think will do all that is claimed for it.
Yours,
T. P. BURCHINAL.

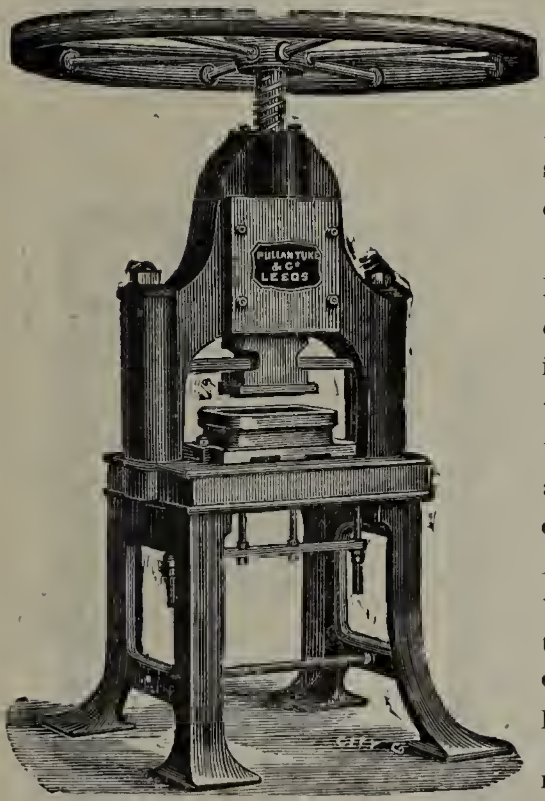
☞Do not fail to obtain our prices on Tile Machines, Brick Machines, Pug Mills, Clay Crushers, etc. For illustrated Catalogues and Price List, address

H. BREWER & CO.,

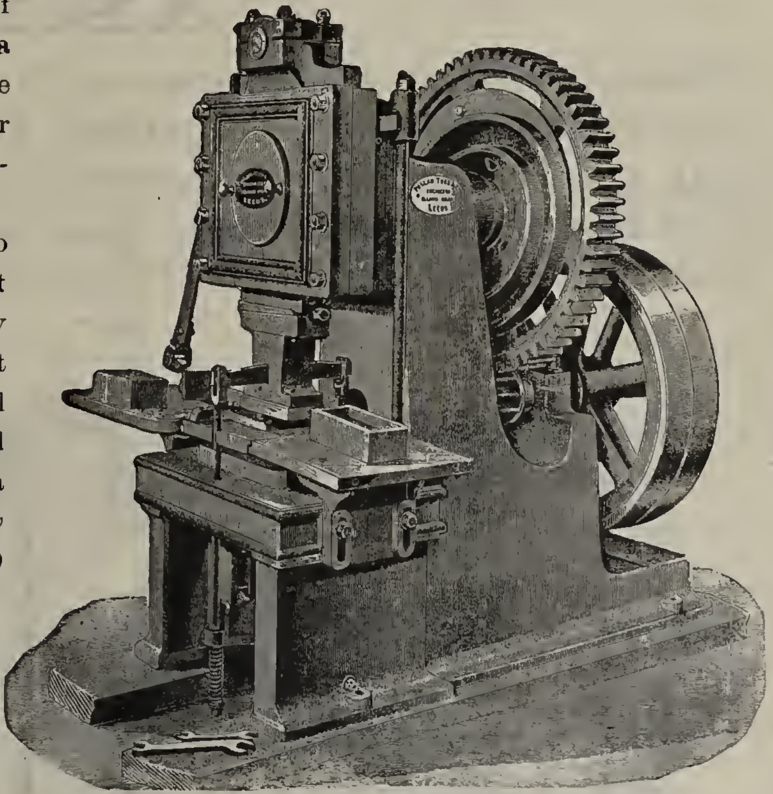
(Mention Clay-Worker.) **Tecumseh, Mich.**


H. BREWER & CO.
TECUMSEH, MICH.

Titlev's Patent Screw Press.



Pullan, Tuke & Gill's Patent Steam Press



We beg to call the attention of Brick, Tile and Terra Cotta Makers to these two Presses as the *Peers of any press on the market* for superiority of finish in the work produced.

The *Steam Press* is best adapted to large works and will produce the best quality of Front Bricks. Its capacity is 10,000 per day of the finest bricks at the smallest cost for labor. For small works and for all makers of moulded and ornamental bricks, tiles and terra cotta, we recommend the *Screw Press.* It will exert a pressure of 30 tons and is to-day *without a rival* the *best press on the market.* Its capacity is 3,000 to 4,000 plain brick per day.

Send for circulars giving all information, with testimonials.

ALFRED CROSSLEY,

Sole Agent for the United States. **Chattanooga, Tenn.**

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ATTENTION, TILE-MAKERS.

Such improvements have lately been made in the production of Porous Earthenwares that the power and facilities usually afforded by the common drain tile manufactory will enable a manufacturer to step into a new and profitable business, protected from competition, at an outlay not exceeding that already invested in his plant, by more than One Thousand Dollars.

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The International Terra-Cotta Lumber Co.,

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to whom all applications and correspondence should be addressed.

TAPLIN, RICE & CO.,

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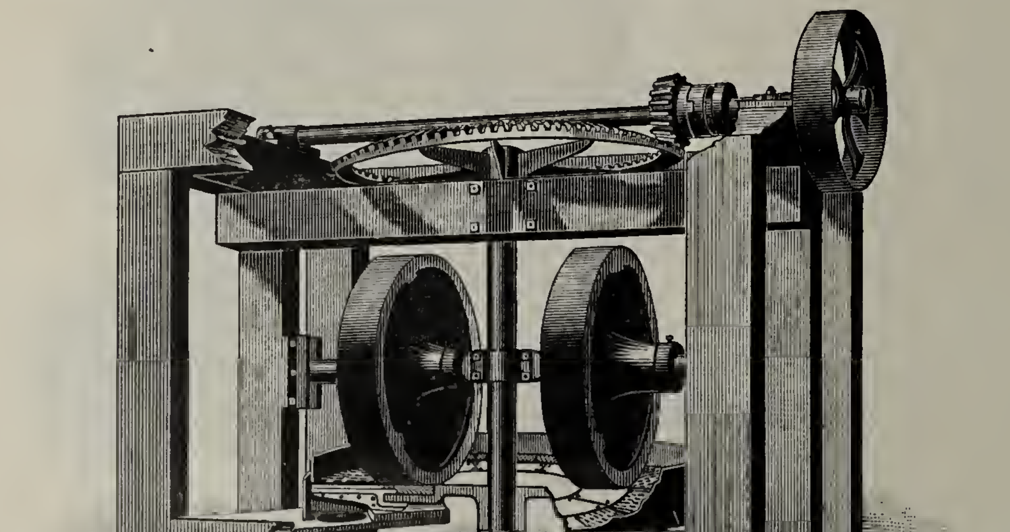
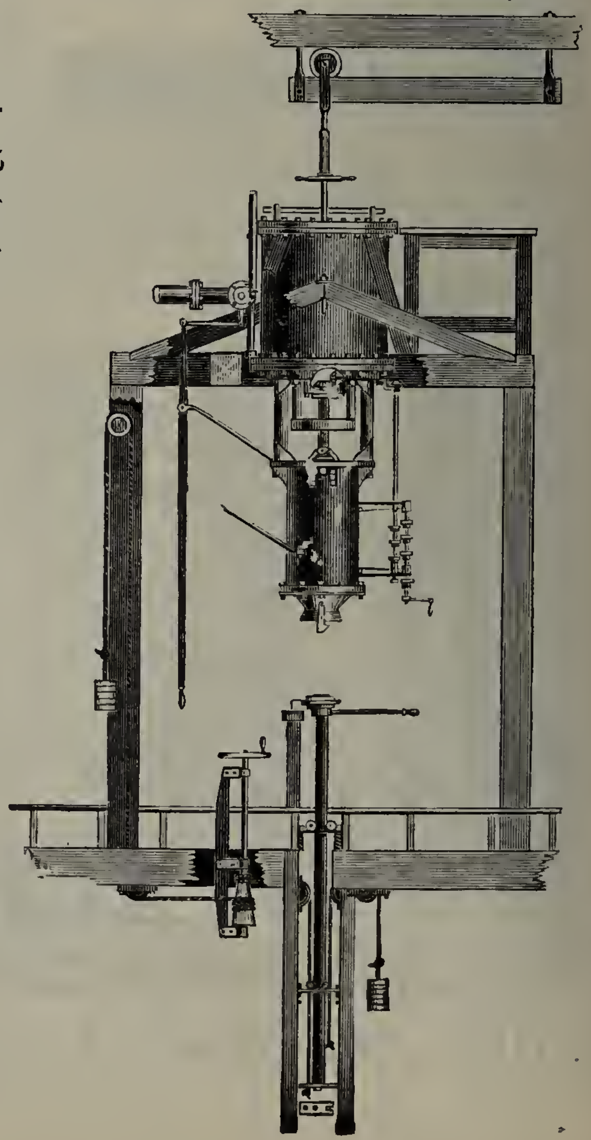
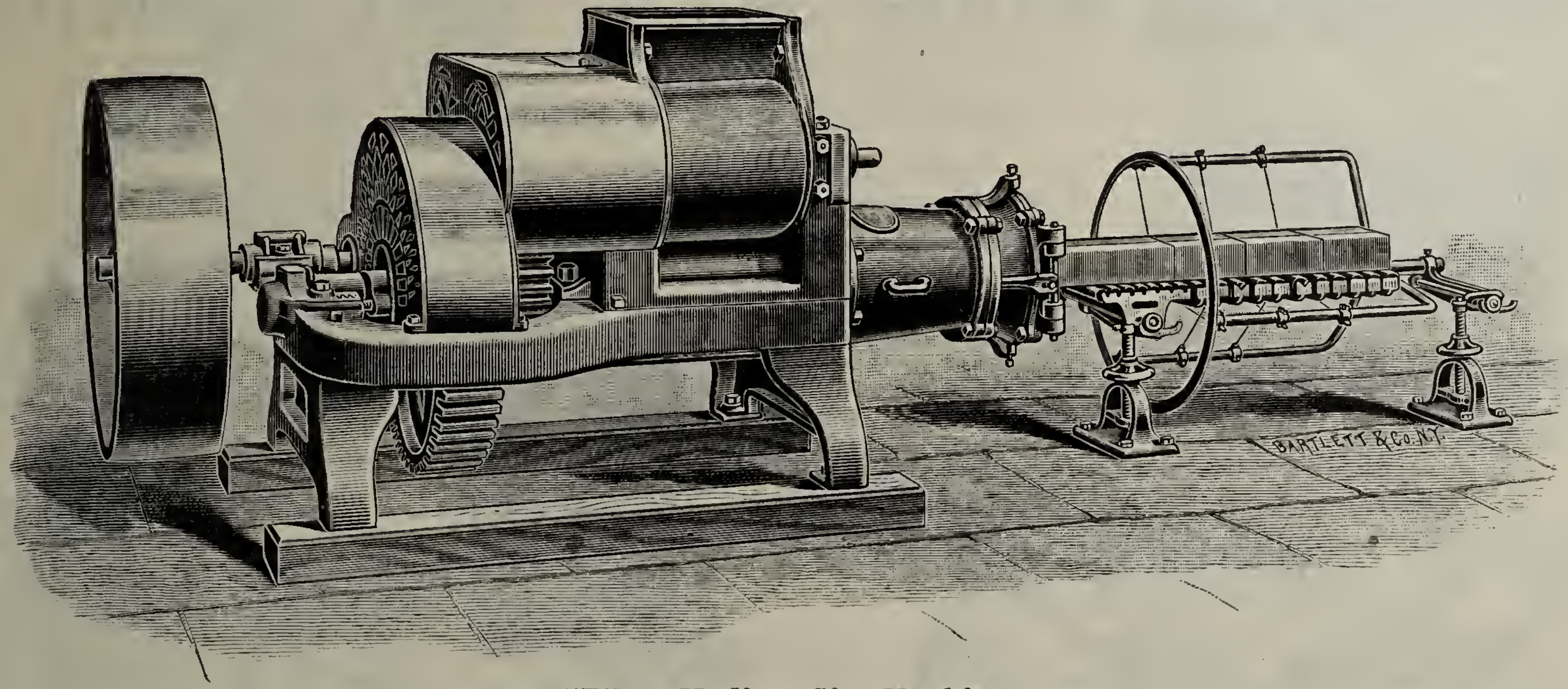
Manufacturers of Improved Clay Working Machinery of all kinds, such as Clay Mills, Dry and Wet Pans, the Barber Steam Sewer Pipe Press, Dies, Clay Blockers, Potters' Wheels and machinery of every description. Write for circulars.





THE OHIO BRICK AND TILE MACHINES.

Now Built in Three Sizes to Meet the Requirements of Different Manufacturers.


BARTLETT & Co. N.Y.

"B" or Medium Size Machine.

Clay Crusher combined with each machine. The A and B sizes of new design, and built with special reference to strength and durability, the heaviest strains being received on wrought iron bars instead of castings. Either size makes end or side-cut brick and tile up to 15 inches. Lubricating brick dies. Cutting tables for both brick and tile superior to all others. Satisfaction guaranteed.

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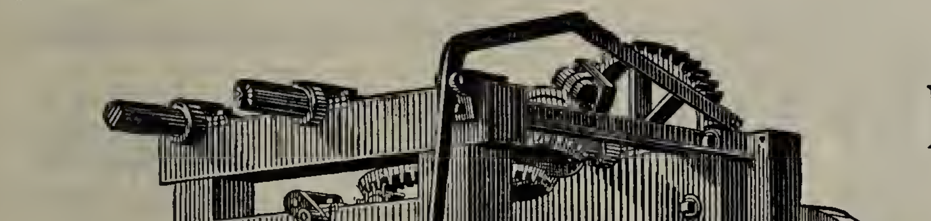


GURNEY

BRICK MACHINE WORKS,

MILWAUKEE, WISCONSIN,

Manufacturers of

THE GURNEY BRICK MACHINE

——Having Crushers Inside of Pug Mill.——

THIS is the only Machine in use which has the *combination of Crushers, Mixing and Moulding Apparatus* in a single machine. The arrangement is covered by patent issued October 6, 1885.

This machine will work any clay, however hard and lumpy, with no preparation before soaking in the usual way. The Crushers will take the clay through as fast as the machine will turn out the brick, *doing entirely away with lumps*, which brickmakers know have been much in the way of making good brick, and also have caused great loss by breakage.

The Machine will turn out four thousand, or more, good, smooth, square brick an hour. With proper moulding sand THE BRICK FROM THIS MACHINE, *made from any clay*, WILL SLIP EASILY. The Machine has been thoroughly tried in different parts of the country.

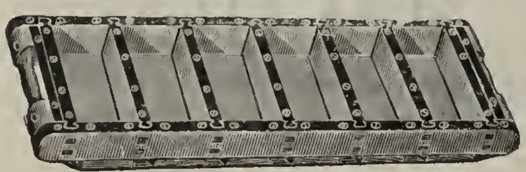
Also First-Class STEAM and HORSE-POWER MACHINES of same pattern, without Crushers.

For further information and Illustrated Catalogue address—

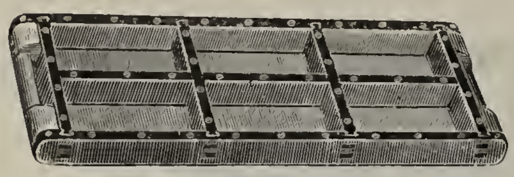
T. C. GURNEY,

100 Wisconsin St., MILWAUKEE, WIS.

6 B. MACHINE MOULD.



6 B. HAND MOULD.



3 B, HAND MOULD.

D. J. C. ARNOLD,

MAKES ∵ BRICK ∵ YARD ∵ SUPPLIES

At NEW LONDON, OHIO.

Get his prices before you buy. **All goods first-class in every respect.**

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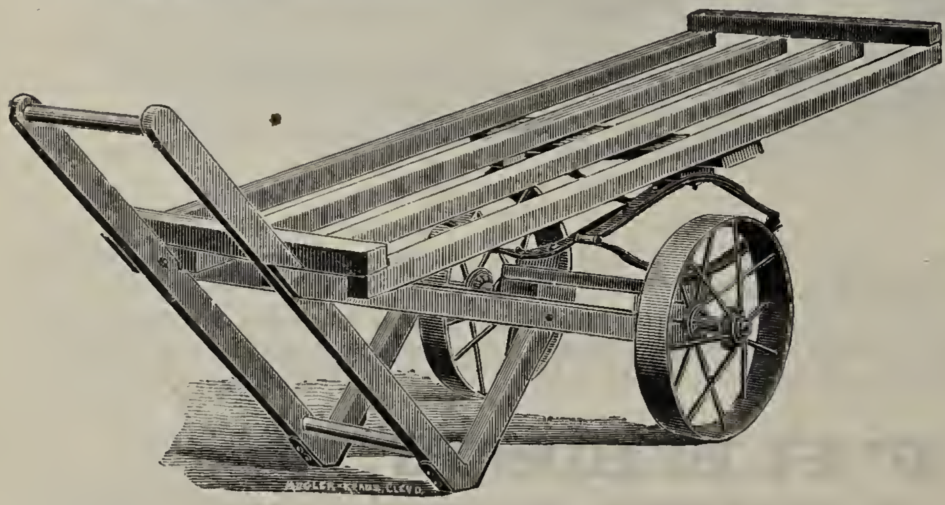
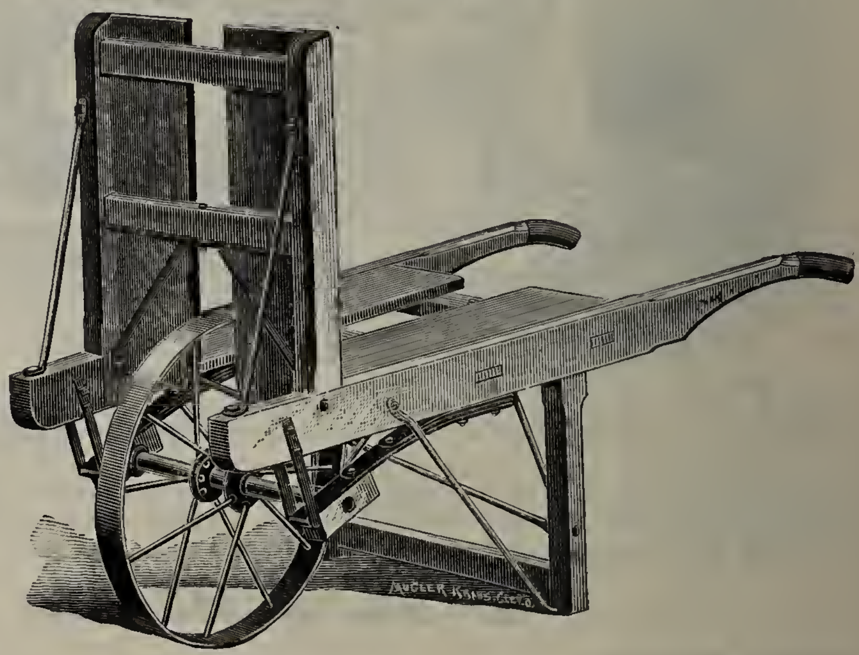


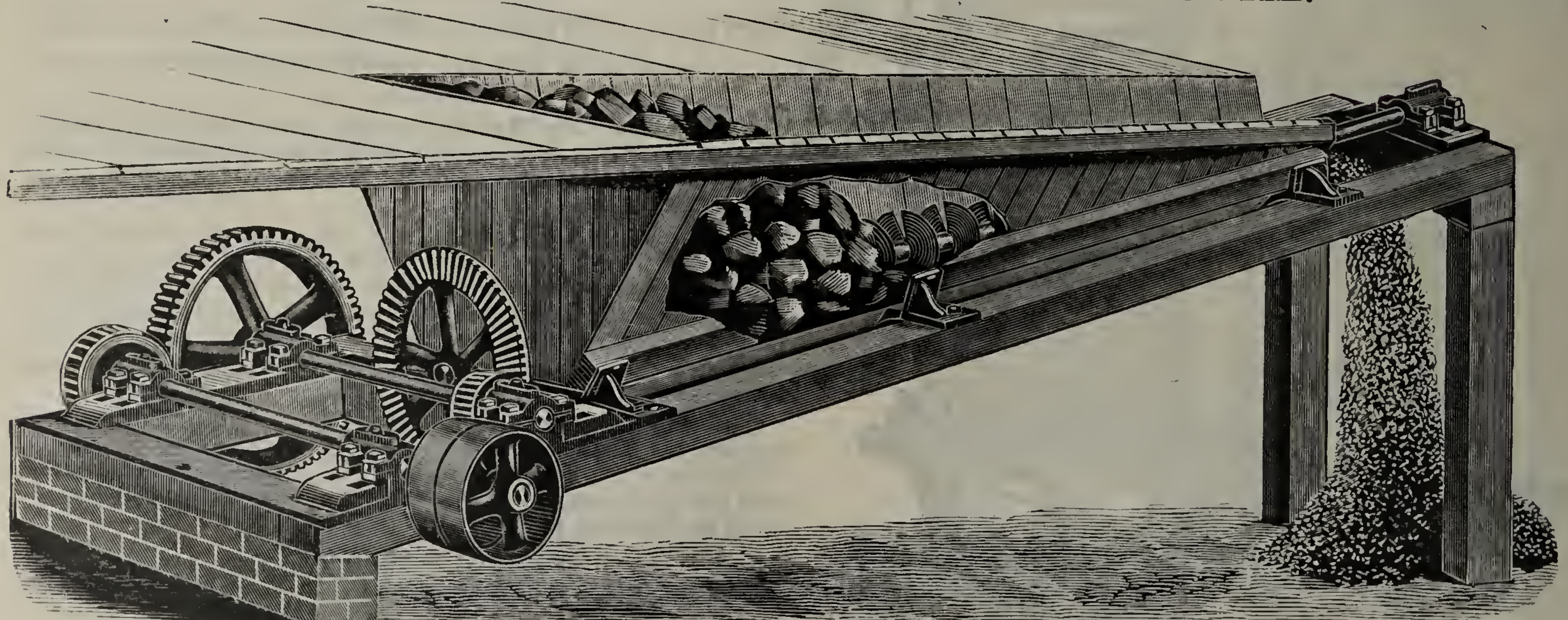
NO. 10 SPRING TRUCK.
(Weight 100 pounds.)



NO. 1 BRICK BARROW.
(Weight with springs 100 lbs.)

Emen's Patent Perfection Clay Granulator and Feeder.

SOLD SUBJECT TO TRIAL AND APPROVAL.



Saves time and labor and produces better ware; simple in construction; rapid and accurate in operation. Every brick, tile and sewer pipe manufacturer should investigate the merits of this machine.

During the past season it was introduced in several of the leading Chicago brickyards and is now at work giving entire satisfaction. Write for descriptive circulars.

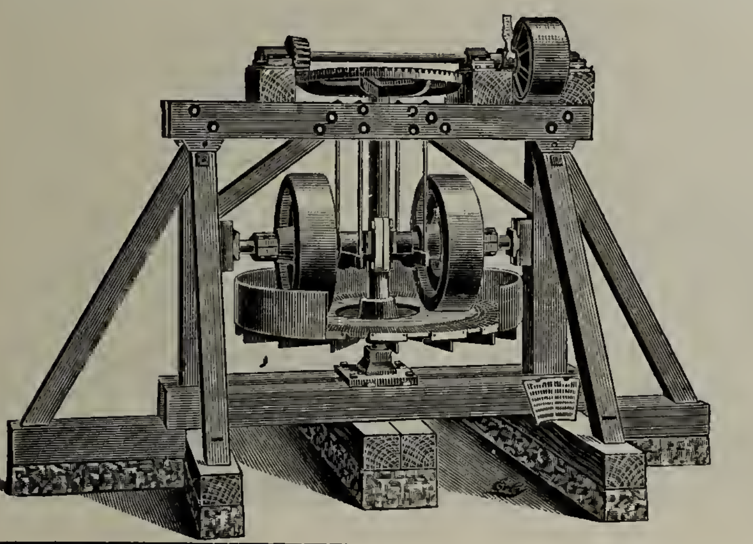
Chambers Brothers Company, of Philadelphia, Pa., are licensed to manufacture and sell these machines.

EMENS AND COLE

[Mention Clay-Worker.]

HOLTON, (MUSKEGON CO.) MICH.

THE FROST
Dry & Wet-Pan Crushers, Chasers, Etc.,



—FOR—

BRICK, TERRA-COTTA, SEWER PIPE AND FIRE CLAY.

—o—

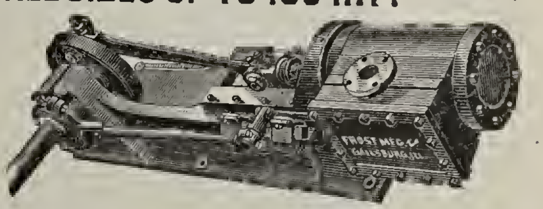
The best and cheapest machines made for working hard clay, soap stone, grog, etc.

Write for prices and other intromation.

The Frost Engine Co.

GALESBURG, ILL.

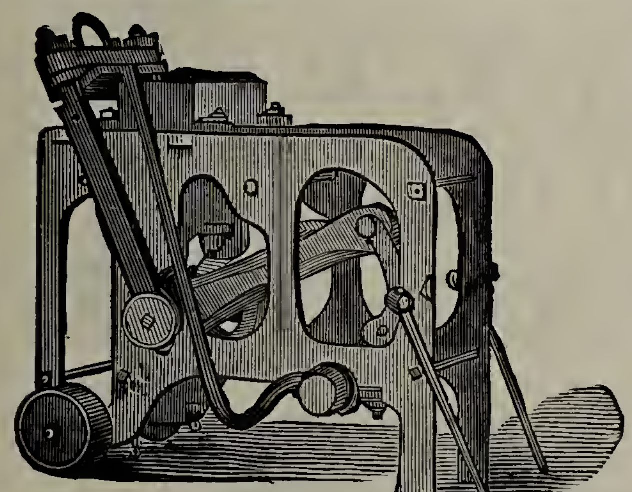
ALL SIZES UP TO 150 H.P.



ELEVATOR SUPPLIES

PULLEYS, SHAFTING, SPROCKETS, BUCKETS, BELTING, SHELLERS, CLEANERS, MILLS, &C.

SEND FOR CATALOGUES



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1819 and 1821 Germantown Avenue,
and Fifth St.,
PHILADELPHIA, PA.

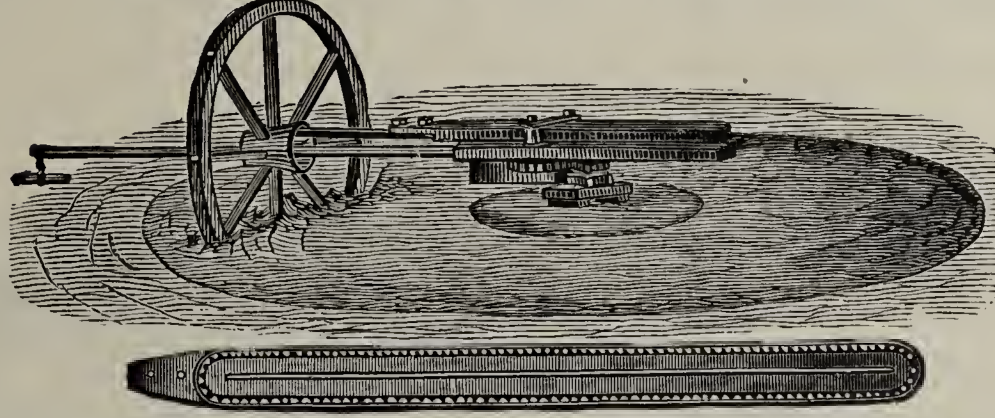
☞Send for Circular and Price-List.

Philadelphia Brick Machine Works

—MANUFACTURER OF—

FIRE AND RED BRICK PRESSES.

Various sizes, from the smallest size up to 24 inches; also, manufacturer of **Clay Mills, Tempering Machinery,** and all kinds of **Brickmakers' Tools.**



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and is fitted up ten per cent. cheaper.

☞Mention THE CLAY WORKER.

ESTABLISHED 1812,
AND CONTINUED ON THE SAME PREMISES EVER SINCE.

MILLER'S
BRICK PRESSES,

Introduced 1844 Latest Improved Patents, Aug. 28, 1883.

SAMUEL P. MILLER & SON,

MAUFACTURERS OF

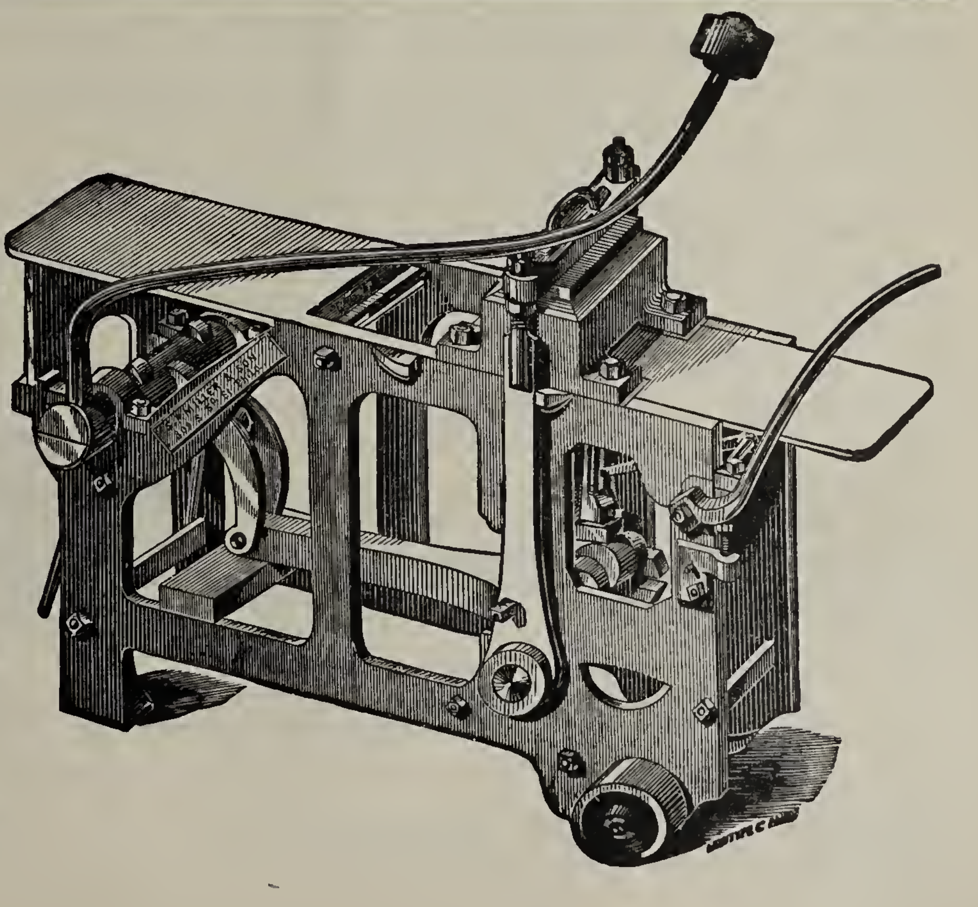
RED AND FIRE BRICK PRESSES,

Of five different styles, embodying all the improvements in Hand Brick Presses in use.

Clay Wheels with Reciprocating Rack, Kiln Castings, Brick Moulds, Clay Spades, and the Tools in General Use for Brick Making.

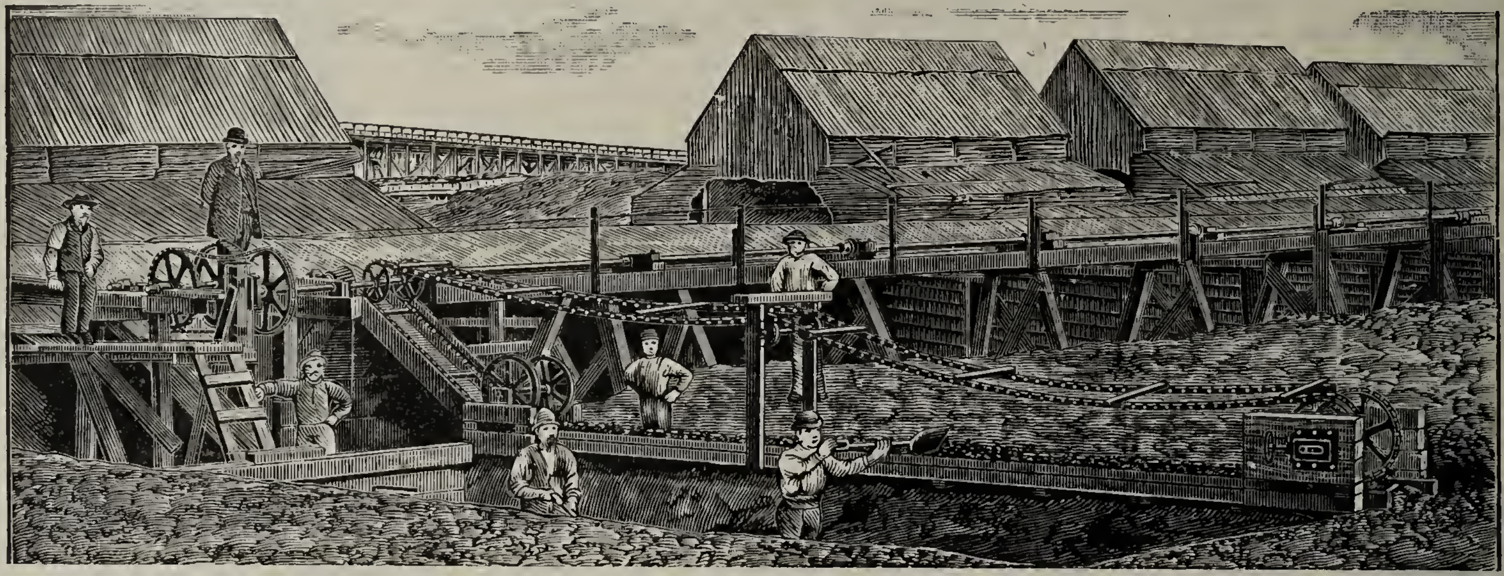
No. 309 SOUTH FIFTH ST., PHILADELPHIA, PA.

S. P. M. & Son refer to Brickmakers generally. ☞ Orders from abroad promptly attended to.



MEY'S CLAY ELEVATOR AND CONVEYOR,

This Elevator is for taking the clay into the brick machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.



It gives the machine a uniform feed, takes less power and manual labor to manipulate and the manufacturer is enabled to make many more thousands of the best quality of brick in a day, than he can by the old method, thereby saving time and making money.

It will carry either wet or dry clay and does not clog. There are many of them now in operation and giving satisfaction in every respect. For further particulars and for Catalogue, address

F. H. C. MEY, BUFFALO, N. Y., U. S. A.

THE NEW IMPROVED
CHIEF BRICK MACHINE.

Patented Jan. 1, 1884, *April* 2, 1884, *and the new improvements of* 1887 *and* 1889.

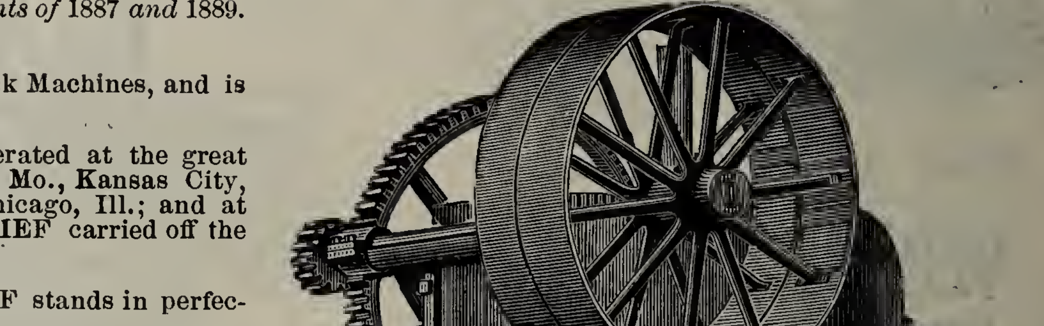
Has taken the lead and stands at the head of all Brick Machines, and is now in operation in every State and Territory in the Union.

In its original construction it was exhibited and operated at the great Southern Exposition at Louisville, Ky.; also at St. Louis, Mo., Kansas City, Mo.; Indianapolis, Ind.; Columbus, O.; Cincinnati, O.; Chicago, Ill.; and at each and all places where premiums were awarded the CHIEF carried off the first prize medal over all competitors.

And with the late new improvements added the CHIEF stands in perfection, at the head of human inventions.

The NEW IMPROVED CHIEF is wonderful in operation, is all steel and iron, and of the greatest strength and durability, is easily operated, and with two horses or a small engine makes 60 to 100 perfect bricks per minute. Grinds, tempers and at the same time moulds into brick any clay. Stones in clay cannot break it, nor interfere with its free operation. It is easily transported, and changed from horse to steam power. It fills the moulds evenly and well until the machine is empty of clay, pressing each brick equally and solid, so all will shrink alike. The pressure can quickly be changed while the machine is running to suit the consistency of the clay. All shafts are of steel; main shaft runs in three boxes or bearings all outside of the machine into which mud or sand cannot penetrate. The wear can at all times be taken up so as to prevent leakage. The clay in the press box is under full control of the plunger, which is direct and positive, and prevents the mud from floating back into the mud drum; this feature is not found in any other mud machine.

Bricks made by the NEW IMPROVED CHIEF, are solid and perfect, and have sharp edges and corners, and do not crumble in burning.



The NEW IMPROVED CHIEF is equally suitable either for small or large yards, the best of bricks are made by it at the least labor and expense, all parts are easy of access and the bearings can be oiled from the outside. All ordinary sizes of brick as well as ornamental brick can be made on the NEW IMPROVED CHIEF and it is especially adapted to making fire brick of any shape with the least danger of breakage and the smallest per cent of lost brick.

The NEW IMPROVED CHIEF is sold on its merits, and warranted to be all that is claimed for it.

We will send Circulars and Testimonials of the NEW IMPROVED CHIEF BRICK MACHINE, New Departure Tile Machine, Engines, Etc., Etc., free to any address on application. Address

Anderson Foundry & Machine Works,

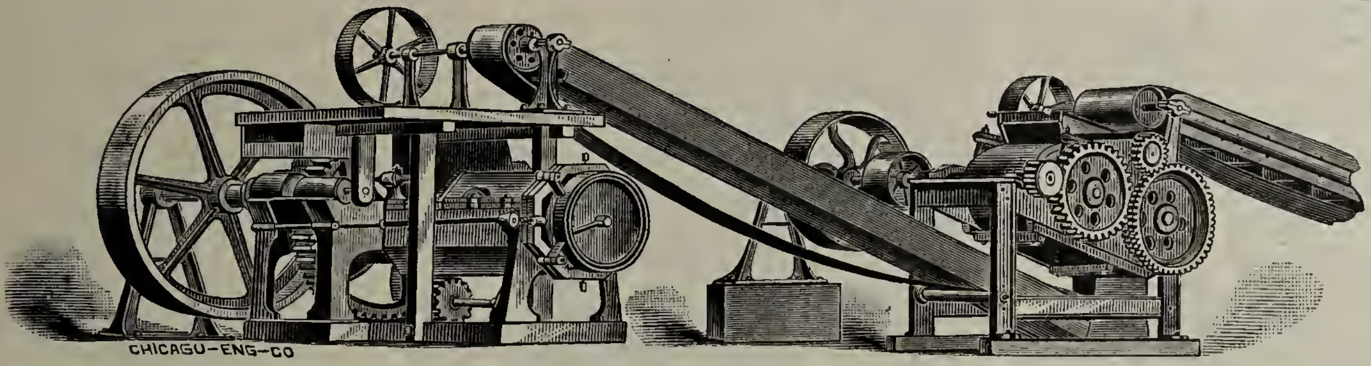
Mention the Clay-Worker.

Anderson, Indiana.

Adrian Brick and Tile Machine Co., Adrian, Mich.,

—— MANUFACTURERS OF ——

Brick and Tile Machinery,



Clay Crushers,
Engines
and boilers.

Also Daso's Builders' and Contractors' Elevators. Steam Fittings and Iron and Brass Castings Furnished to Order.

The working qualities of our machinery at its present state of development as estimated by one of the prominent Brick Manufacuring Companies of Kansas City, are stated in the following reply to a letter of inquiry addressed to them:

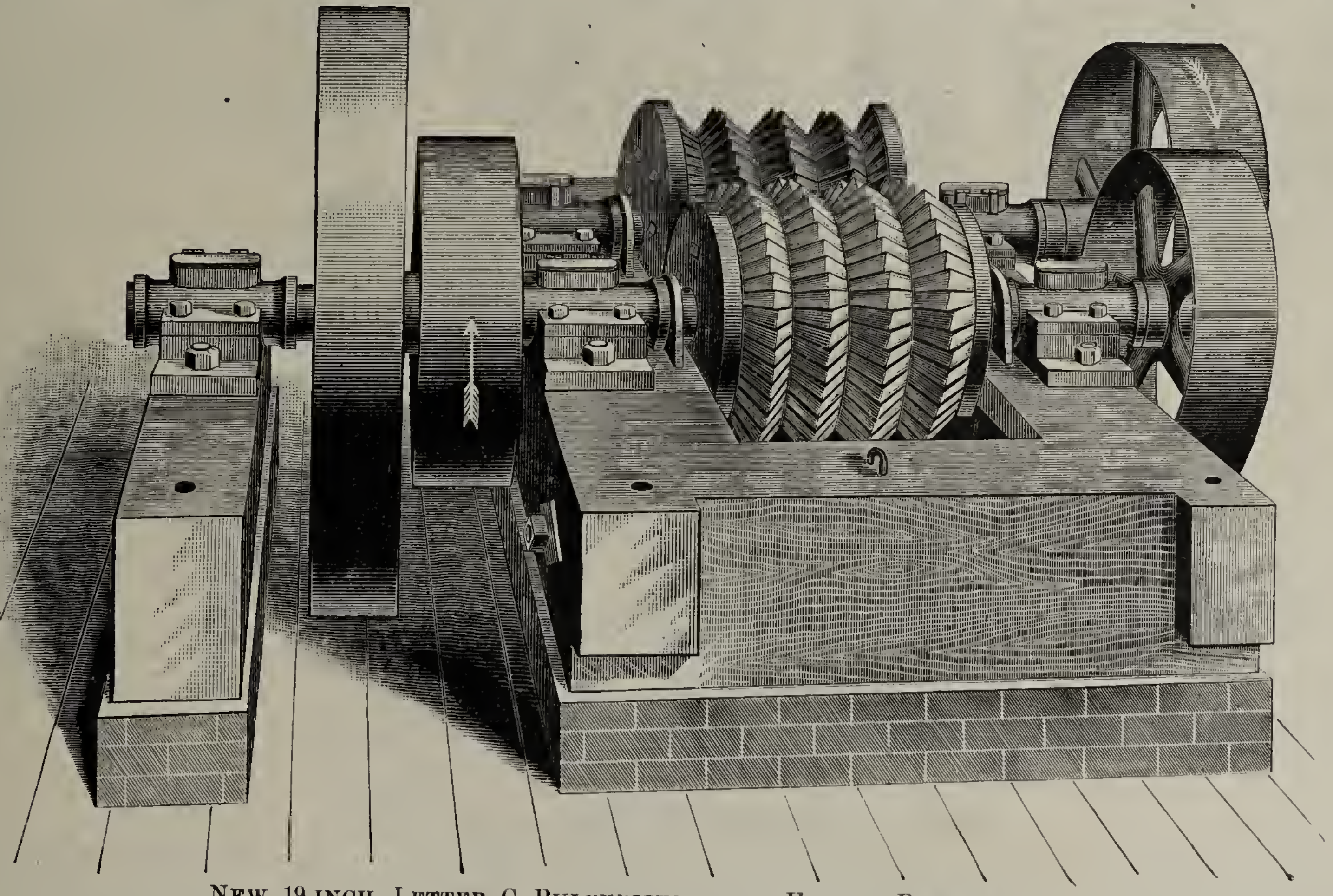
JOHN GIBSON, Esq., Monticello, Iowa: KANSAS CITY, MO., August 21, 1888.

DEAR SIR—In answer to your favor of the 16th will say, that we do not think there is any room for improvement in the Adrian Brick and Tile Machine Co's No. 4 Cut-off Table, as it cuts the brick as near perfect as possible, without tearing the edges; thus leaving the ends of the brick as perfect as the face. We are also using the new dies on both our machines, and are well pleased with them, as they are 100 per cent. better than the old style and turn out a perfect column of clay without warping or twisting. We have two No. 3 McKenzie machines and they are doing excellent work for us and we averaged during July, 26,800 brick, each, per day. In conclusion we will say that both the new tables and the new dies are so incomparably superior to the old ones that it gives us much pleasure to recommend them.

Very truly yours,
SEDDON & EDWARDS BRICK CO.

NEWELL IMPROVED CLAY PULVERIZER

We Guarantee the Material and Workmanship and allow a Trial of our Machine to any Responsible Party.



NEW 19-INCH LETTER C PULVERIZER, WITH HOPPER REMOVED.

Heavy Cold Rolled Shafts running in best Anti-Friction Metal Bearings, protected from dirt.

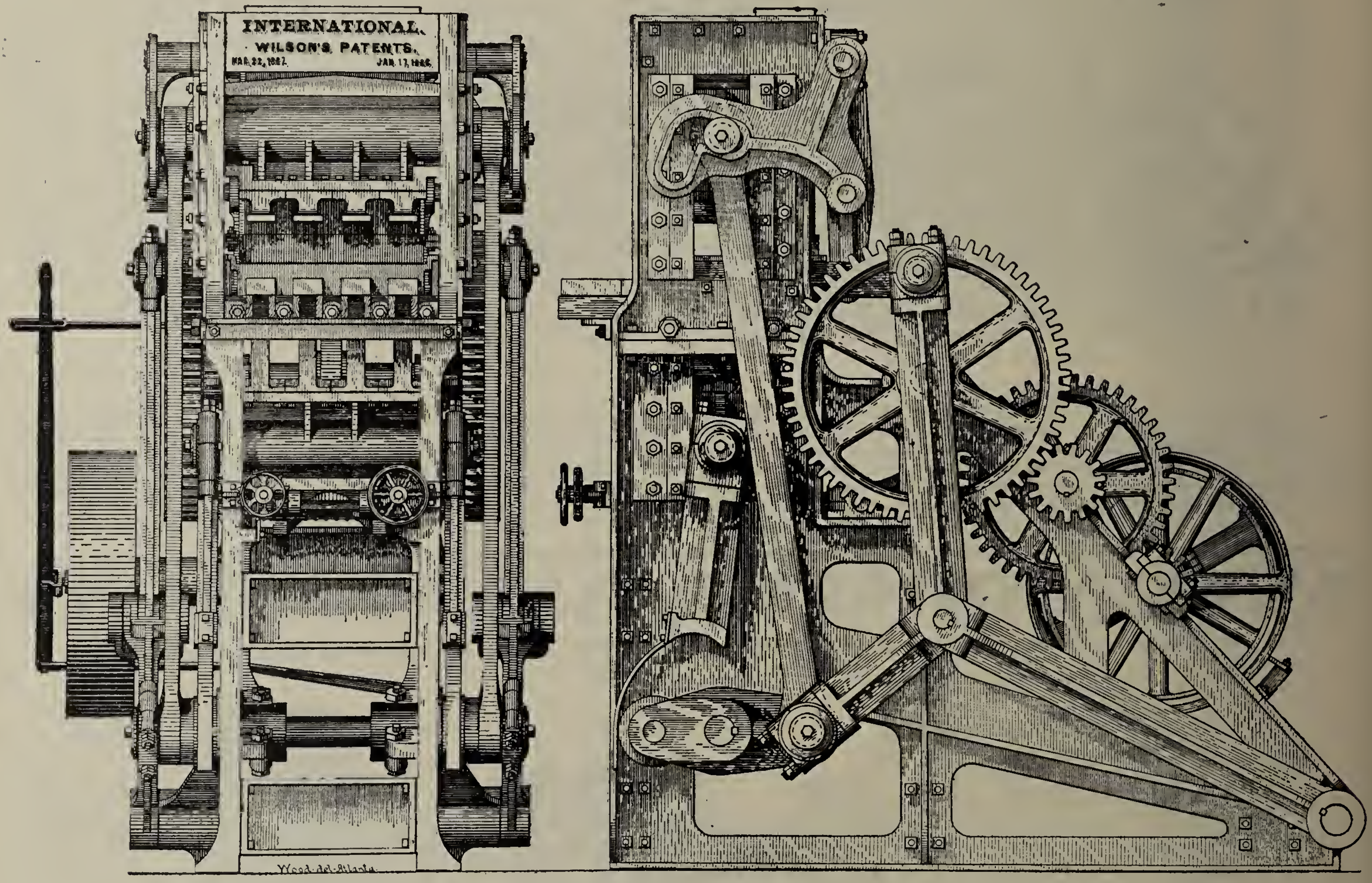
A FEW OF OUR CUSTOMERS AND REFERENCES:

Henry Maurer & Son, (3 Pulverizers) 420 E. 23rd St., New York City.
Peerless Brick Co., Philadelphia, Penn.
Perth Amboy Terra Cotta Co., (2 Pulverizers) Perth Amboy, N. J.
Syracuse Pressed Brick Co., Syracuse, New York.
Potomac Terra Cotta Co., (2 Pulverizers) Washington, D. C.
Siuer & Brother, Frankford, Penn.
W. H. Perot, Baltimore, Md.
The Rathbun Co., Deseronto, Ontario, Canada.
Murrill Dobbins, (3 Pulverizers) Philadelphia, Penn.
American Brick & Tile Company, Phillipsburg, New Jersey.

Send for Illustrated Circular and Price List

NEWELL UNIVERSAL MILL CO., - 10 Bethune St., NEW YORK.

The International Semi-Dry Brick Press.



It is admitted by experts that this machine leads all other steam brick machines not only in pressing power, but strength and simplicity of construction as well as amount and excellence of product. The power exerted on the lower dies is not wasted on dead abutments, but reciprocated by the upper dies and at the same time balancing all strain. The International weighs about 14,000 lbs. Can be shipped intact all ready for work. Any intelligent laborer can operate it. All bearings and guides are outside the frame secure from wear by falling clay.

JOHN F. LANG'S TESTIMONY,

Tallapoosa, Ga., June 29, 1888.

Mr. B. J. Wilson, Atlanta, Ga.: DEAR SIR—The "International" four-brick Semi-dry Brick Press bought of you is giving entire satisfaction. Our regular speed is 18 revolutions to the minute, but we often run as high as 20, thus establishing its capacity at 48,000 brick in 10 hours. The character of the work is first-class in every particular—no granulations, all corners firm and sharp even in the salmon brick. Yours Very Truly, JOHN F. LANG, Pres. Tallapoosa Mallable Iron Co.

Owing to ill health and the infirmities attendant on old age, I am unable to put this machine properly upon the market and would be pleased to correspond with parties with a view to selling such an interest as will secure that end. In my condition, I am prepared to give a great bargain. As to personal reliability, commercial standing, I refer to all banks and business men in Atlanta Correspondents will please give references.

N. B.—The cost of building will be found 25 per cent. lower than any other machine on the market.

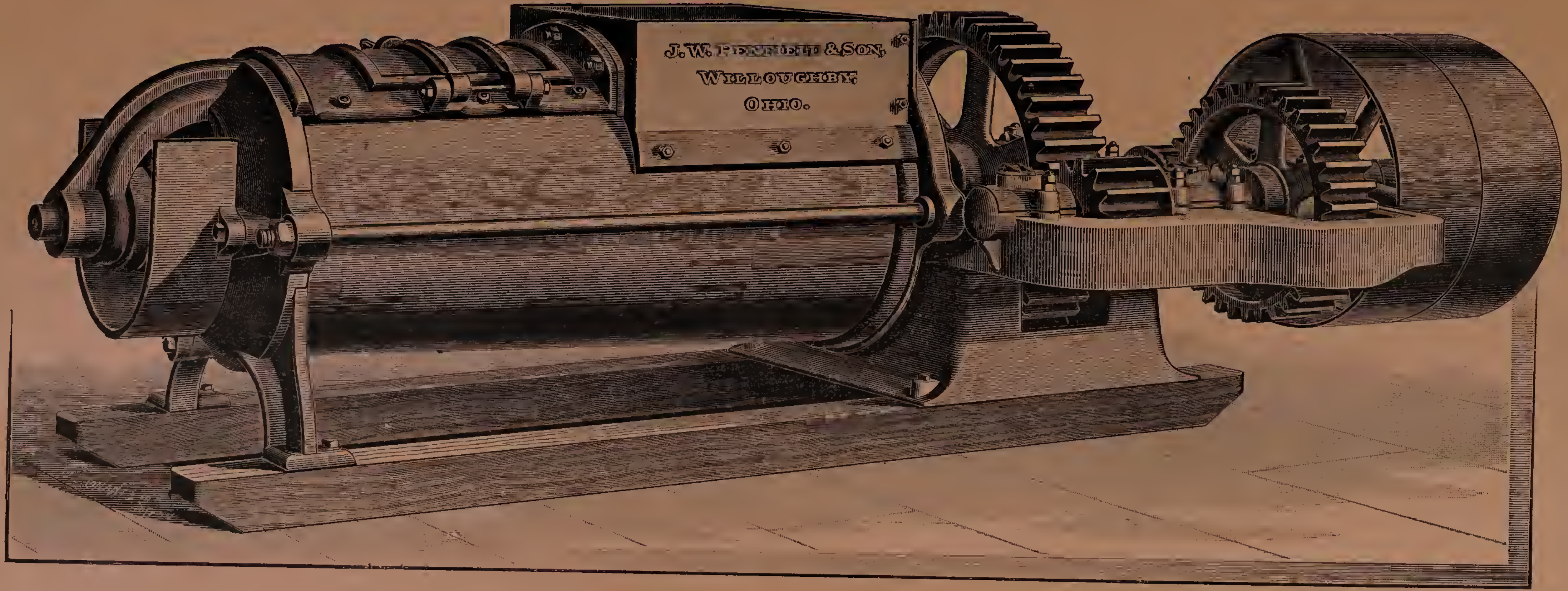
B. J. WILSON, PATENTEE,

(Mention Clay-Worker.) **West End, Atlanta, Ga.**

THE PENFIELD
IS
THE BEST.

❀ Stiff Clay Machinery for PAVING and Building Brick. ❀

✺ Upright Stock Brick Machine for Sand Mould Brick. ✺



No. 10 D HORIZONTAL PUG MILL.

PUG MILLS AND GRANULATORS A SPECIALTY

For particulars, address

J. W. PENFIELD & SON,
Willoughby, Ohio, U. S. A.

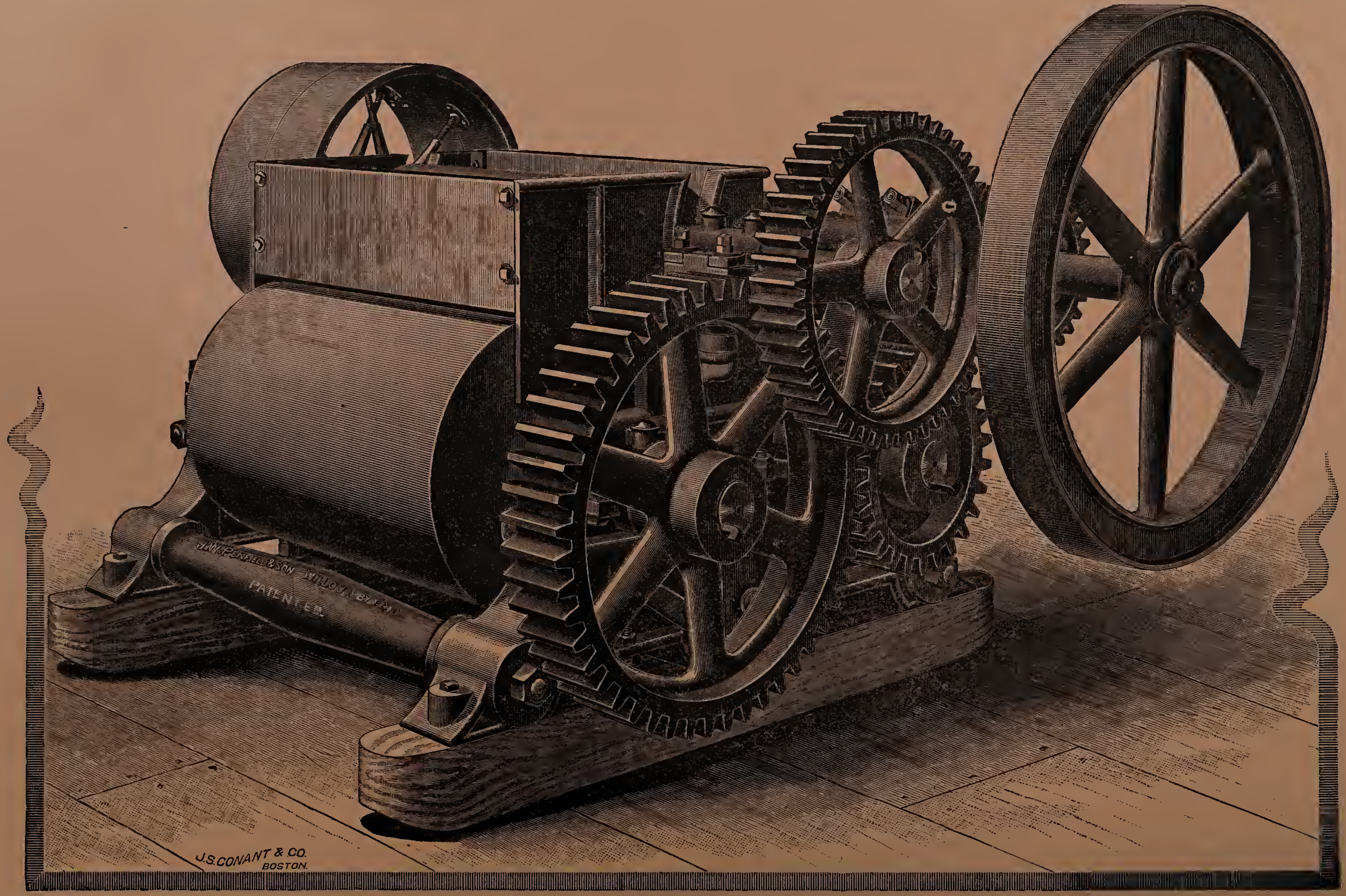
(Mention Clay-Worker.)

The ❊ Penfield ❊ Clay ❊ Crushers ❊ and ❊ Stone ❊ Separators.

TWELVE SIZES AND STYLES NOW MANUFACTURED.

Line Shafting, Pulleys, Hangers and Yard Supplies.

Clay Elevators, Dry Cars and Turn Tables.


J. W. PENFIELD & SON WILLOUGHBY, O. PATENTED.
J.S. CONANT & CO. BOSTON.

NO. 10 S SMOOTH ROLL CRUSHER.

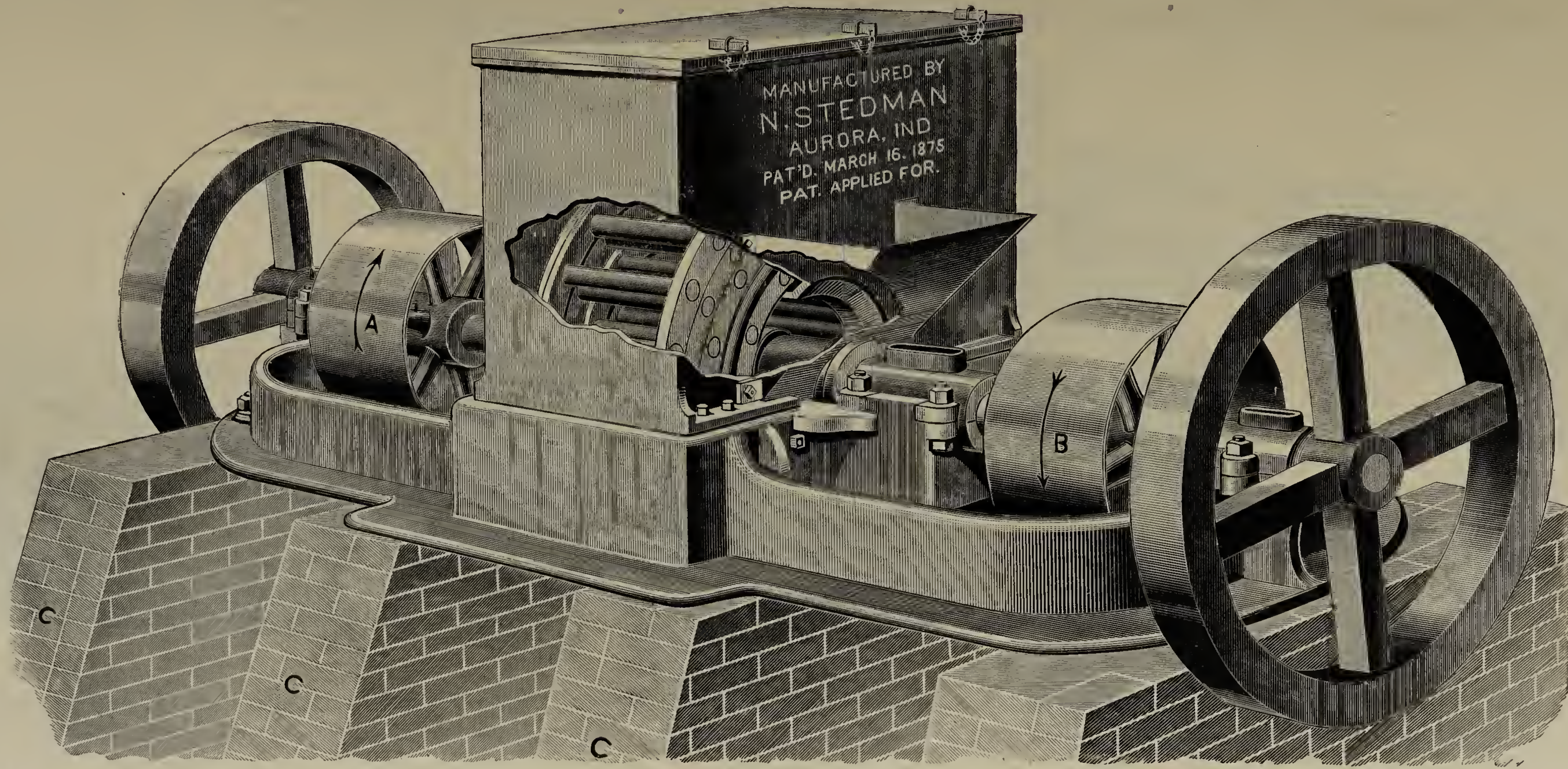
For particulars, address

J. W. PENFIELD & SON,

WILLOUGHBY, OHIO, U. S. A.

Mention the Clay-Worker.

Stedman's Improved Disintegrator and Pulverizer.



To Brick, Tile and Pottery Men and to Terra Cotta Works, this Mill is invaluable. It reduces the clay to a fine, light and soft condition, with its full adhesive properties retained.

This mill will disintegrate or pulverize the following materials: Clay of all kinds, Shale and Slate direct from the bank for Brick and Tile, Fire Clay and Sand Stone Rock—for Cement and Fire Brick—Iron Ores of various kinds, Guano, Phosphates, Bones—green, dry and steamed—Tankage, Bone-Ash, Salt Cake, Soda, Cracklings, Oyster Shells, Animal Matter in almost all conditions, Old Fire Brick and Tiles, Old Pottery Ware, Plastic Clay, Asbestos, and in fact, almost any material that can be disintegrated.

A good Disintegrator and Pulverizer is a long felt want in many branches of business. This Mill is an improvement over any yet made and is the result of practical experience. It is made in three sizes: 30, 40 and 48 inches. The capacity for clay is as follows: 34-inch Mill will pulverize for from 15,000 to 25,000 brick per day. 40-inch Mill will pulverize for from 20,000 to 35,000 brick per day. 48-inch Mill will pulverize for from 75,000 to 100,000 brick per day. For prices and further information, address

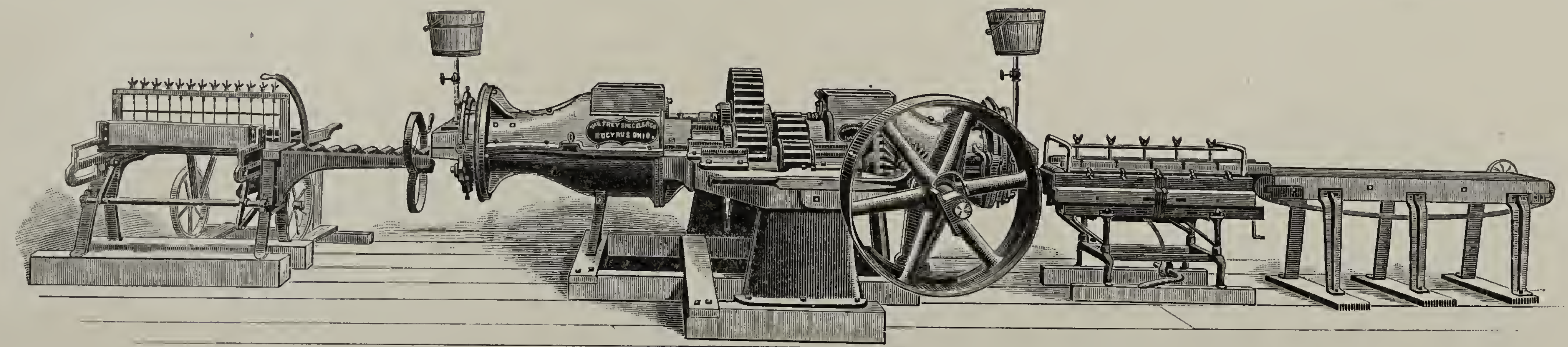
STEDMAN'S FOUNDRY AND MACHINE WORKS,

AURORA, IND.

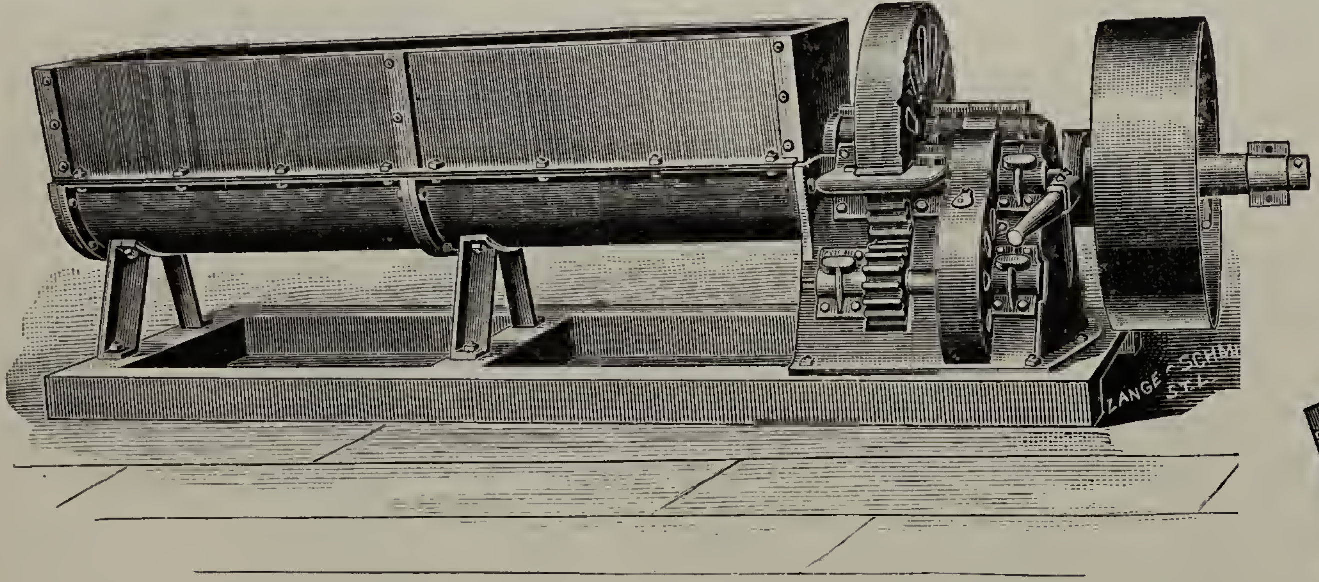
PROTECTED BY PATENTS.

Mention the Clay-Worker.

THE DUPLEX ACME BRICK MACHINE

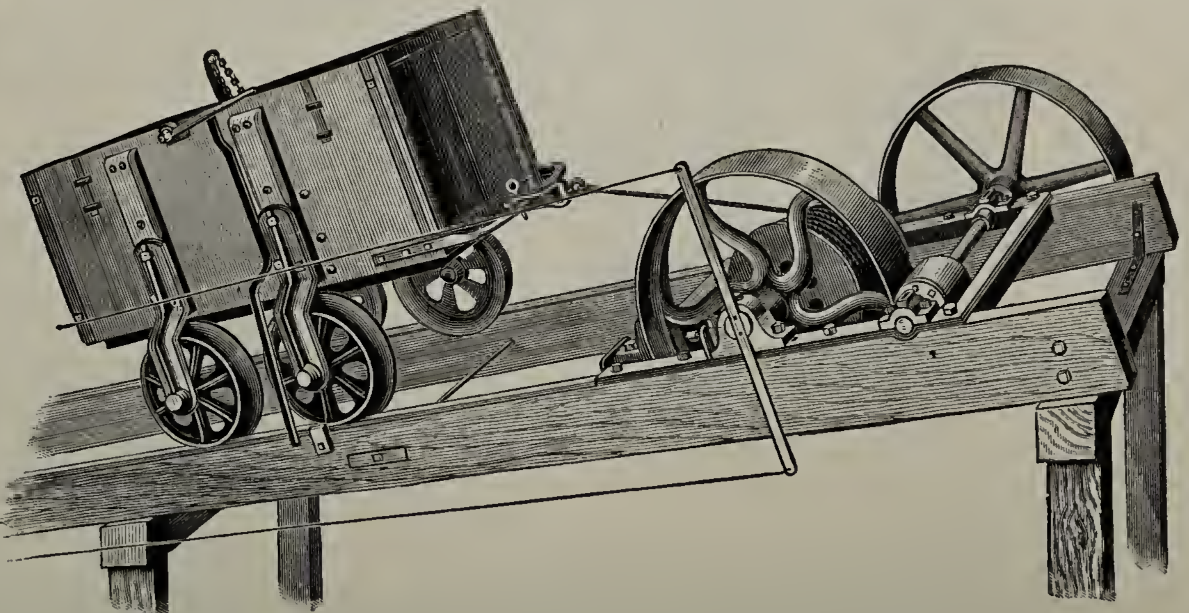


Will make double amount of brick and has no friction on end shaft. The cut shows it arranged with Self-loading, Side-cut Board Delivery Cutting Table, and an End-cut with Auxiliary Carrying Belt. Capacity from 60,000 to 80,000 brick per day. A double Pug-mill is manufactured to suit this double machine.



The Acme Open-top Pug Mill, Solid Iron Frame, Tub 8 feet long, Steel Shaft and Knives.

Winding Drum and Dump Cars. Two sizes Winding Drums, Bottom and Side Dump Cars.



We manufacture seven different brick machines and full factory outfits. A new Double Repress weighing 7,000 pounds just constructed. Capacity 20,000 brick per day. Send for illustrated circulars to

Mention Clay-Worker.

FREY-SHECKLER COMPANY, Bucyrus, Ohio.

WALLACE MANUFACTURING COMPANY,
LITTLE WONDER
BRICK MACHINE.
Frankfort, Ind.

MANUFACTURERS OF

Clay Crushers, Stone Separators and Pug Mills.

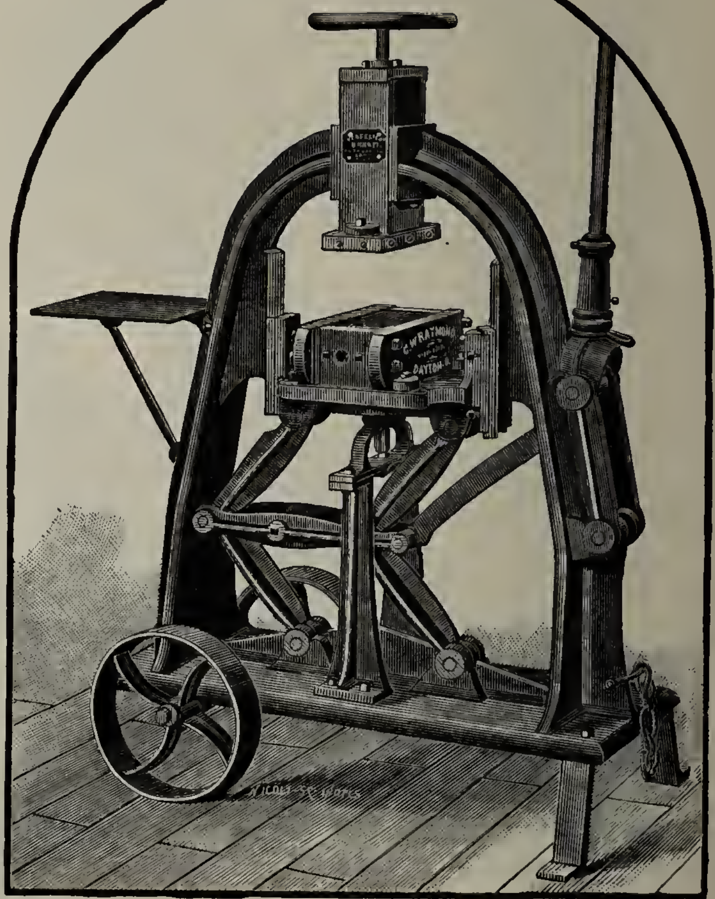
Full line of Clay-working Machinery.

RAYMOND'S
PERFECTION BRICK PRESS.

(NO. 1 FOR RED BRICK. NO. 2 FOR FIRE BRICK.)

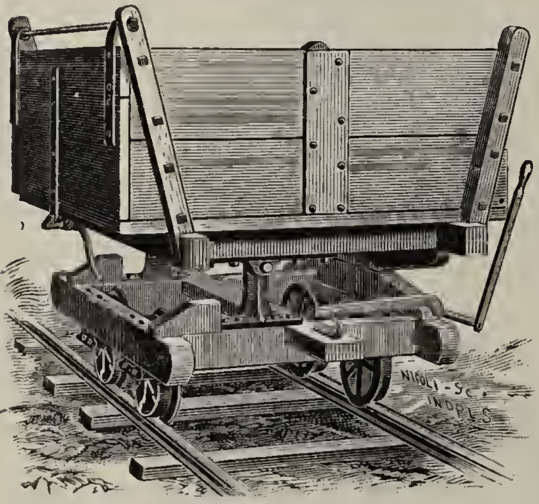
SIMPLE, POWERFUL.

Its whole action is derived from a short, easy, but powerful movement of one lever. A Perfect press which turns out perfect work.



——MANUFACTURERS OF——

AUTOMATIC DUMPING CARS,



For Brick Yards, Gravel Pits, Plantations, Mines, Etc.

SAVES TIME.

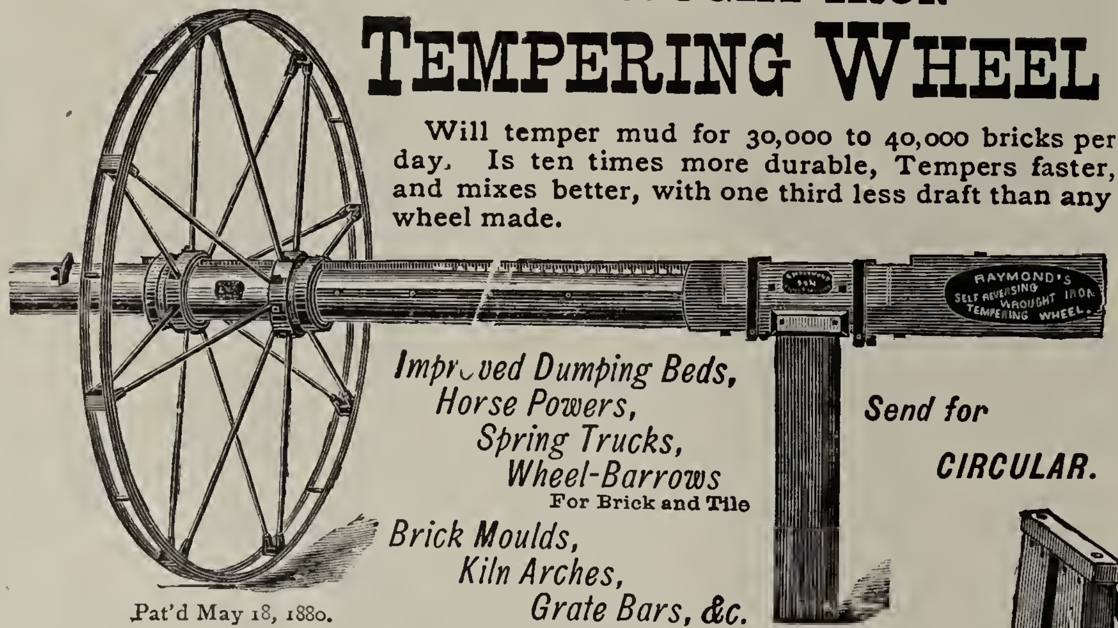
SAVES LABOR,

SAVES MONEY.

Write for Illustrated Catalogue giving full description.

RAYMOND'S WROUGHT IRON TEMPERING WHEEL

Will temper mud for 30,000 to 40,000 bricks per day. Is ten times more durable, Tempers faster, and mixes better, with one third less draft than any wheel made.

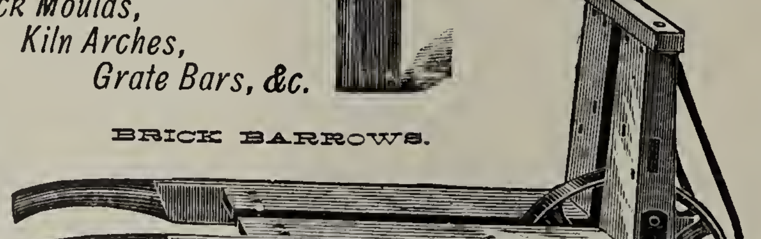

RAYMOND'S SELF REVERSING WROUGHT IRON TEMPERING WHEEL.

Pat'd May 18, 1880.

Improved Dumping Beds,
Horse Powers,
Spring Trucks,
Wheel-Barrows For Brick and Tile
Brick Moulds,
Kiln Arches,
Grate Bars, &c.

Send for CIRCULAR.

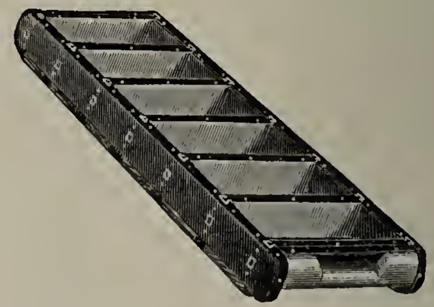
BRICK BARROWS.



Our Barrows are made from the best of seasoned white-oak, braced in front and cross braces underneath; iron wheel and axle and three coats of paint; the frame is morticed throughout. They will stand the rough usage of the brick yard. For strength and durability they have no equal.

BRICK MACHINE MOLDS.

We manufacture a great number and variety of molds and with improved machinery, we are able to fill orders with dispatch. Our molds are made of the best of cherry wood



with side pieces gained for partitions and each partition is in turn dove-tailed into the sides. **They are thoroughly iron bound.** The cross-irons being dove-tailed. Without doubt, the most substantial mold made.

C. W. RAYMOND & CO.,

7 & 11 WAYNE STREET, (Mention Clay-Worker.) DAYTON, OHIO.

Laidlaw Manufacturing Co., Hamilton, Ont., Special Agents for our goods for Dominion of Canada.

THE POTTS DISINTEGRATOR

—IS THE—

Only machine made that will pulverize wet or dry clay, putting it in the best possible condition for making brick or tile.

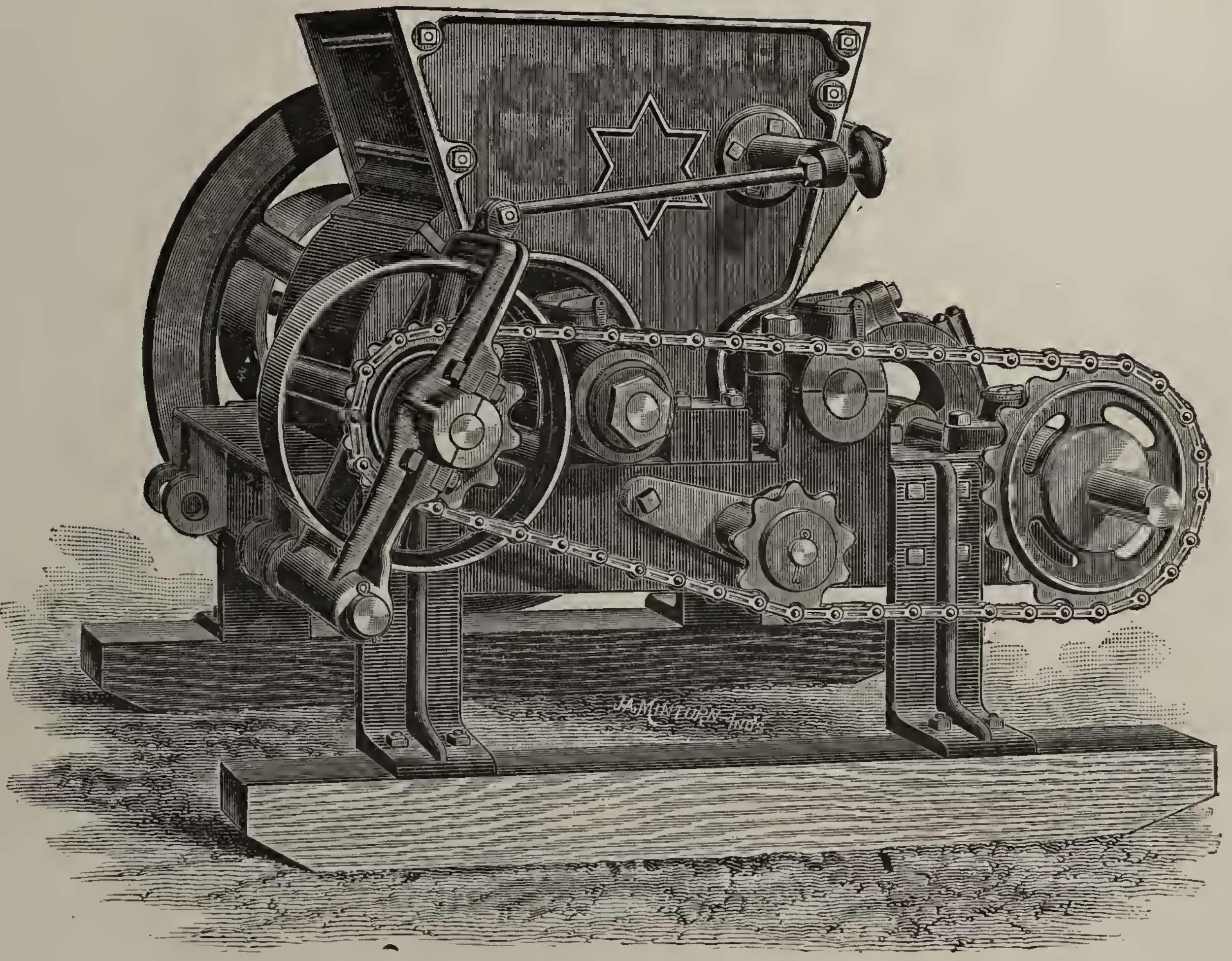
It pulverizes all stones so fine that they will not show in brick after being burned.

It is indispensable where hard, tough clays are being worked.

Clays which will not soak or take water and are considered hard to work, are worked with ease and the brick made are superior to those made by pit soaking the clay.

These machines not only grind the clay, but thoroughly mix the same.

All machines are guaranteed to give satisfaction and are shipped subject to trial.



A WARNING.

Jonathan Creager's Sons, of Cincinnati, Ohio, are now manufacturing a Clay Disintegrator which is an infringement on our Patents. We have brought suit against them in the United States Circuit Court for the Southern District of Ohio.

We presume that this will be accepted as a sufficient answer to their statements in May number of Clay-Worker that our former notice was meant for bluff only.

We intend fully to protect our rights, and only waited until it was apparent that they were being wilfully infringed to bring suit.

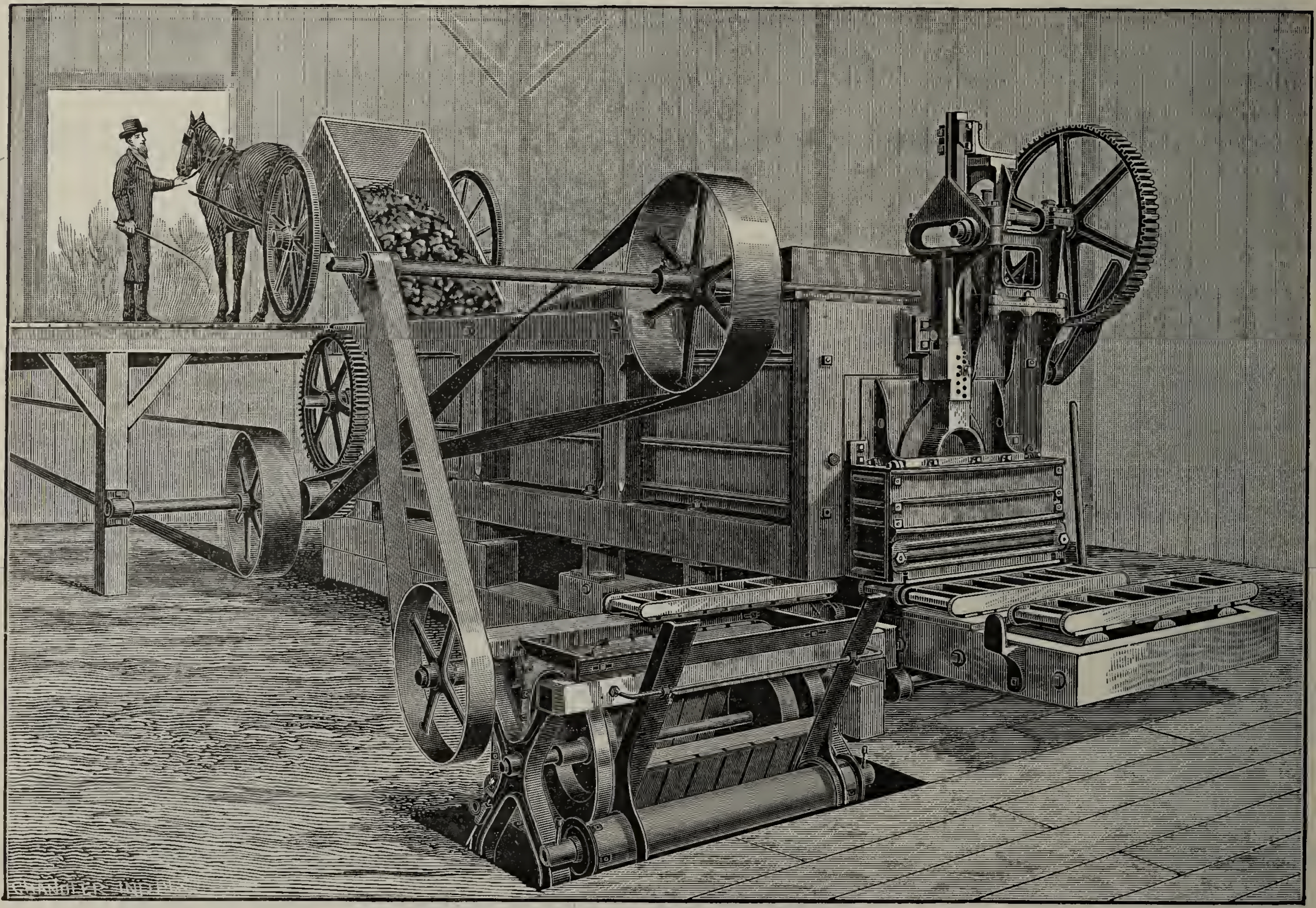
Our Patents are numbers 322,393, *dated July* 14*th*, 1885, 368,898 *dated August* 28*th*, 1887, *and* 384,278 *dated June* 12*th*, 1888.

Our Brick Machines, Pug Mills, Disintegrators and Mould Sanders have no equal. Write for prices and terms.

C. & A. POTTS & CO.,

INDIANAPOLIS, - - INDIANA.

The Potts Horizontal Stock Brick Machine.



Requires no extra Pug Mill to work the clay direct from the bank.

It has the largest tempering capacity of any machine on the market.

All brick made have clean, smooth surfaces and sharp corners.

It works the clay stiff enough to make the finest Stock Brick.

Our Mould Sander shown in cut has taken the lead of all machines for this purpose. There is no place for the moulds to catch and cause delays. It will not spill or waste any sand. It is easily and quickly adjusted to any size mould.

☞**NOTICE**:—A. H. Newton, of Cohoes, N. Y., claim our machine is an infringement on patent owned by them, and that persons using our machine will be prosecuted. As to this we would say that we do not infringe said patents; that we have put our machines on the market only after a careful investigation, to ascertain exactly what our rights are in the premises, and, being fully satisfied of our rights, we are prepared to protect our customers and Patents No. 397,274 of Feb. 5, 1889.

We are prepared to erect complete plants of any capacity and keep in stock full line of **Brick Machines, Pug Mills, Disintegrators, Mould Sanders** and all brickyard supplies.

Do not fail to write for prices and catalogue.

C. & A. POTTS & CO.,

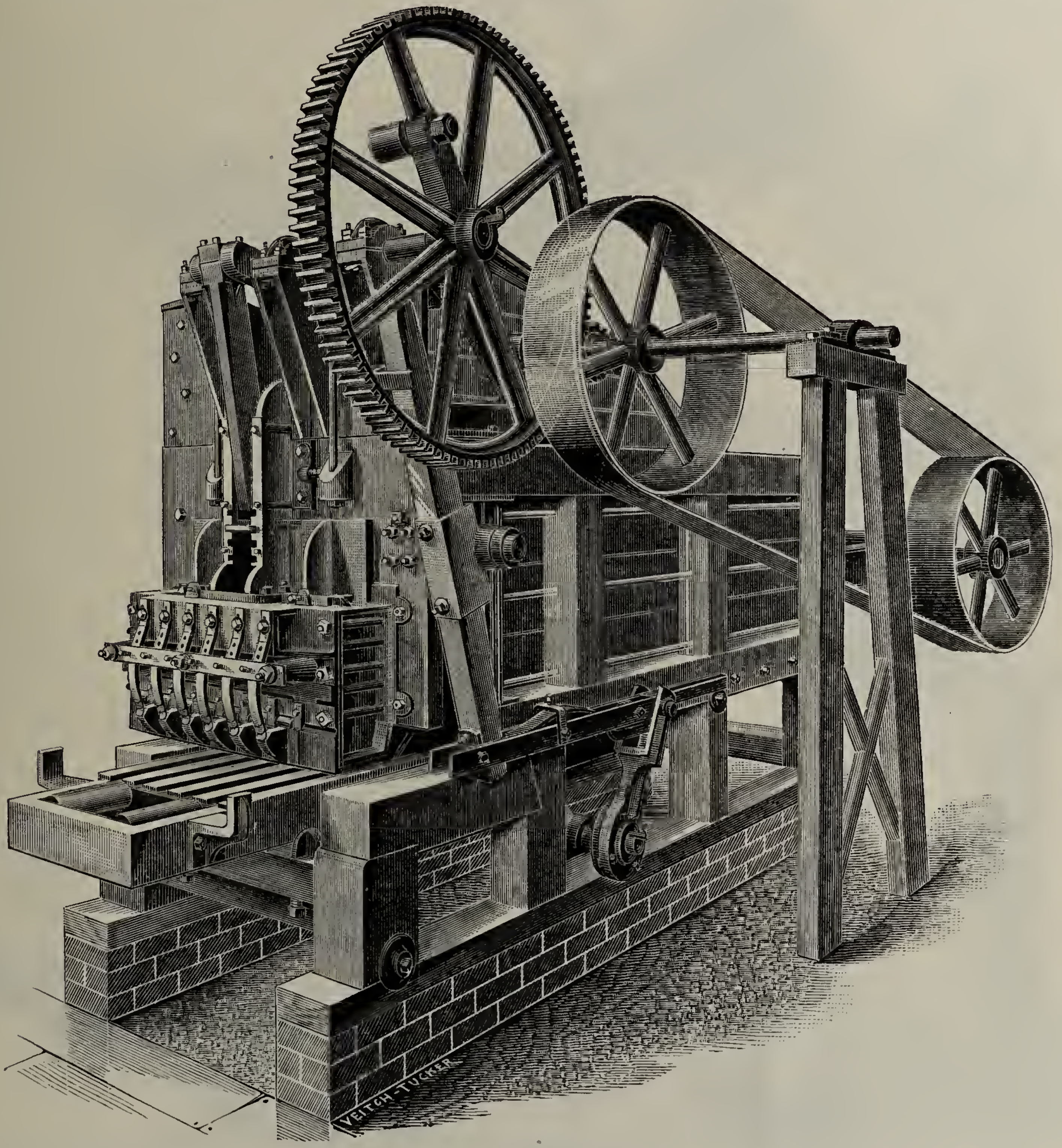
[Mention the Clay-Worker.]

INDIANAPOLIS, INDIANA.

THE "NEW HAVEN"

HORIZONTAL STEAM POWER BRICK MACHINE.

WEIGHS 12,000 POUNDS.



SIMPLE, STRONG, DURABLE.

No Pug Mill Required.

HEAVIEST, MOST POWERFUL, and **BEST MACHINE** on the market for making sand moulded brick being carefully designed to secure the **Greatest Possible Production of First-Class Brick with the Least Outlay and Loss of Time to Repair Breakages.**

We have found Brickmakers (now using this machine) who think it wiser to buy a substantial Machine than waste time, exhaust patience and lose money with the many cheaply constructed machines with which the country is flooded and we are positive there are many others who think the same way. If you are one of them write us and we will tell you all about it.

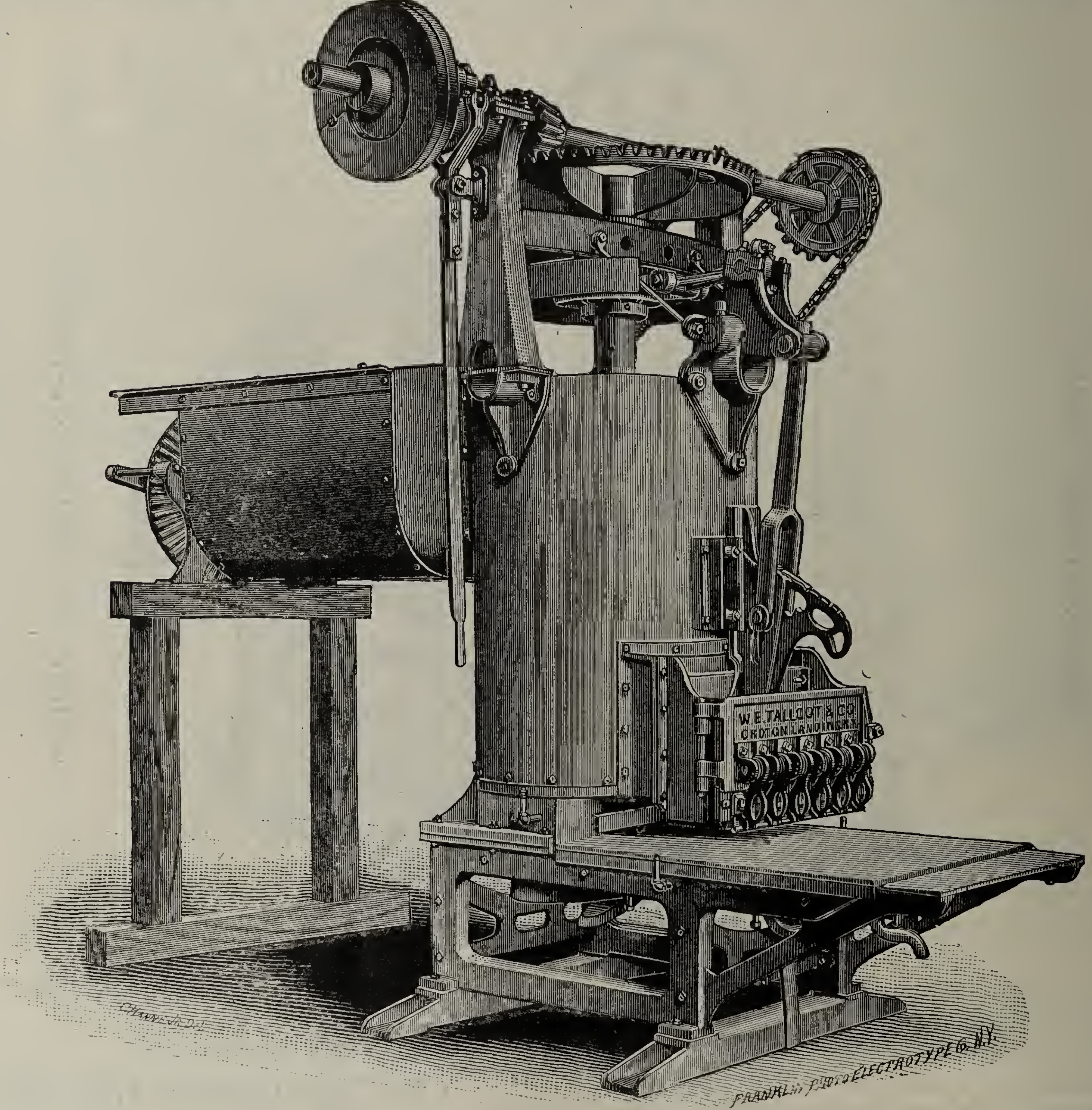
We believe our years of experience with Brick Machine repairs and the advice of a practical Brickmaker has enabled us to produce a Machine Superior to all.

The McLagon Foundry Co.,

NEW HAVEN, CONN.

[Mention the Clay-Worker].

W. E. TALLCOT & CO'S.
I. X. L. Brick Machine and Improved Pug Mill.


W. E. TALLCOT & CO
CROTON LANDING N.Y.
FRANKLIN PHOTO ELECTROTYPE Co. N.Y.

This is a simple and powerful machine, making a superior brick and possessing advantages over all others. It is the result of years of experience in using and manufacturing brick machines. Among its advantages are *Great Strength*, *Simplicity and Durability*, few parts, well protected from sand, yet easy of access for adjustment, renewal and repair. No wood is used in its construction; it is made all of iron and steel. Perfect automatic action to prevent breakage by stones or other obstructions. Great tempering capacity and ability to mould very stiff clay. It is easily understood, easily operated, easily kept in order. Quality of brick made, unsurpassed.

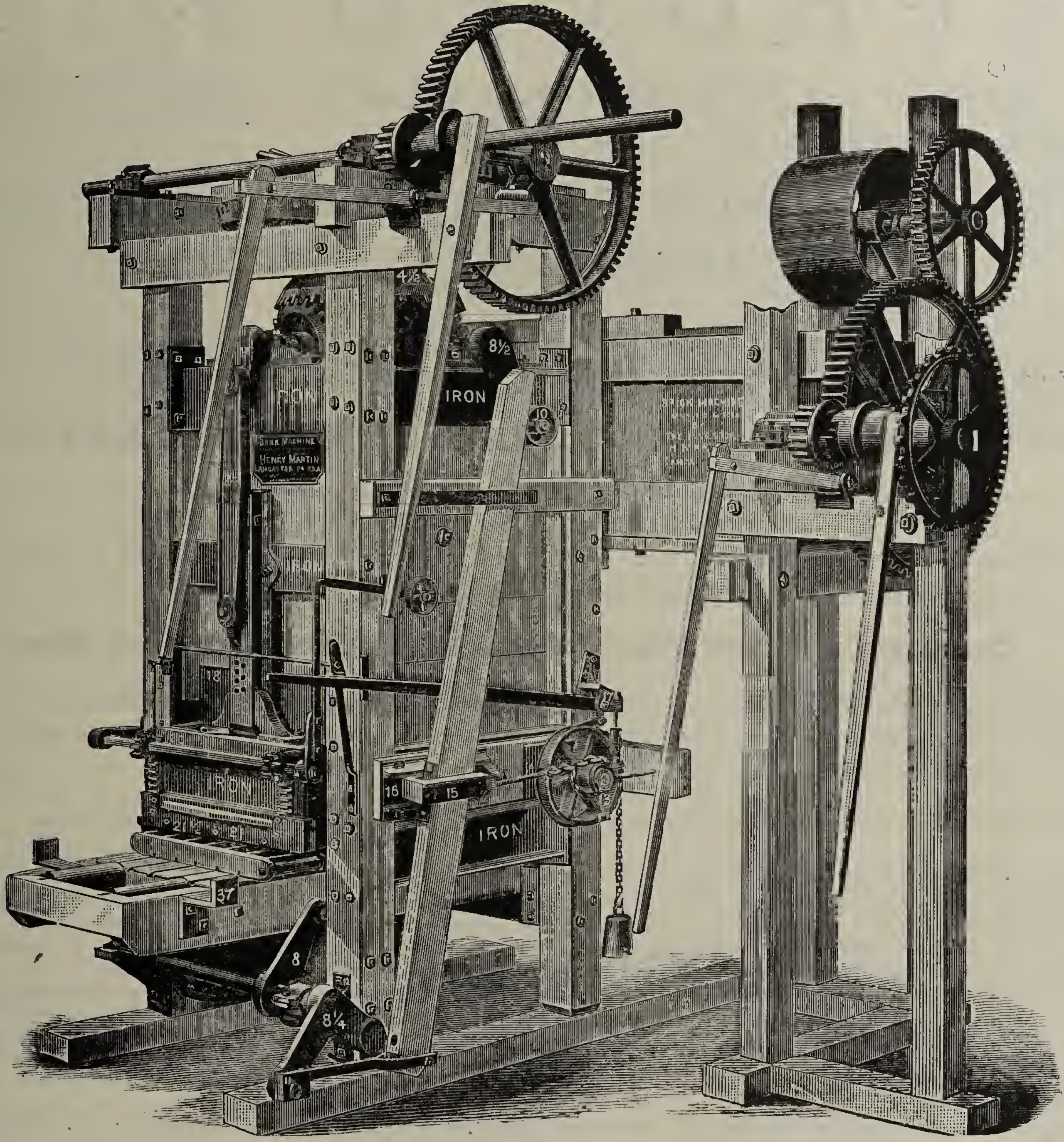
The I. X. L. is eipecially designed and built for heavy work. Weight of Machine and Pug Mill 10,000 pounds. Weight of Machine without Pug Mill, 7500 pounds. Send for circular and prices.

It will pay you to use the I. X. L.

W. E. TALLCOT & CO.,
Croton Landing, New York

The Henry Martin Brick Machine.

For Steam or Horse-Power.



WITH OR WITHOUT PUG MILL

WITH OR WITHOUT PUG MILL.

This cut represents our Steam-Power Machine and Pug Mill combined. It is the strongest. It is the best It is the most simple. It is the most perfect. It does the best work. It works any clay. It does not get out of order. It is not liable to break down. It stands hard usage.

BETTER THAN EVER.

Our machines are this season the Best ever built by our Mr. Henry Martin, whose thirty years' experience has rendered him familiar with the wants of the Trade.

For Strength, Durability, Qantity of Output and Quality of Work, they have no equal.

Brickmakers make no mistake when they buy the Henry Martin Machine.

——MANUFACTURED BY——

The Henry Martin Brick Machine Mfg. Co.,

Send for a Catalogue. LANCASTER, PA., U. S. A

MORRISON'S

IMPROVED KILN

FOR -:- BURNING -:- CLAY -:- WARES

Especially adapted to Burning Common, Repressed and Ornamental Brick.

PATENTED IN UNITED STATES AND CANADA.

SUCCESSFUL! DURABLE!

Daily product of our Kilns in the United States, One-Half Million Bricks. Our claims fully substantiated BY OUR PATRONS. We claim ninety to ninety-five per cent. hard brick. Arch bricks all Fronts and Pavers and none damaged—of uniform color. Pressed brick burned without fire-marks—coal screenings preferred for fuel. One fireman for two hundred thousand bricks. The

Only Kiln That Regulates the Temperature of Heat

And directs its course by a system of air drafts, giving complete control of the degree of heat, as well as its manipulation. This system we have covered by letters patent. Any persons using these air drafts are liable to prosecution for infringement.

Read the following testimonial from a recent patron, and another new one from an old patron:

Knoxville, Tenn., October 31st, 1888.

R. B. Morrison, & Co., Rome, Ga.:

GENTLEMEN—I have used your *Improved Kilns* during the past twelve months and cheerfully report the result. We burn our bricks in your Kiln at a cost of sixty-five cents per thousand for fuel and labor; a saving to us, over our old method, of eighty cents per thousand on the two items. My saving in waste brick in the kiln and at the building is fully *ten per cent.*, or sixty cents per thousand in other words. Every time I burn your kiln of 300,000 bricks it is a saving to me of *more than four hundred dollars* over the old process. I find your kiln durable and simple to operate. We use coal screenings for fuel. Have no waste in arches, and burn ninety per cent. hard brick. I have no hesitation in pronouncing your kiln a success in every respect, as you make no claims it does not fulfill. Yours Truly,

REPS. JONES.

Atlanta, Ga., July 20th, 1888.

R. B. Morrison & Co., Rome, Ga.:

GENTLEMEN—We have used your Improved Kilns for three years and during that time have burned upward of a hundred millions in them and wish to emphasize our former statement in regard to your kilns. They are reliable, durable, and the best kilns for our purpose, we have been able to find after investigating many of the various kilns in use, and say to our friends of the trade: If you want kilns that will burn your brick nearly all hard, and do it every time, burn them economically and without loss, and with little cost for repairs, secure the Morrison Kiln. CHATTAHOOCHEE BRICK CO., per GEO. W. PARROT, Vice-Pres.

Royersford, Pa., (near Philadelphia) August 20, 1889.

Mr. E. Petts: DEAR SIR—In reply to your letter will state that our Morrison Kiln turned out O. K. It was the best kiln of brick we ever saw—*no waste and nearly all hard.* A. T. KEELEY.

——WE SELL OUR KILN STRICTLY ON MERIT——

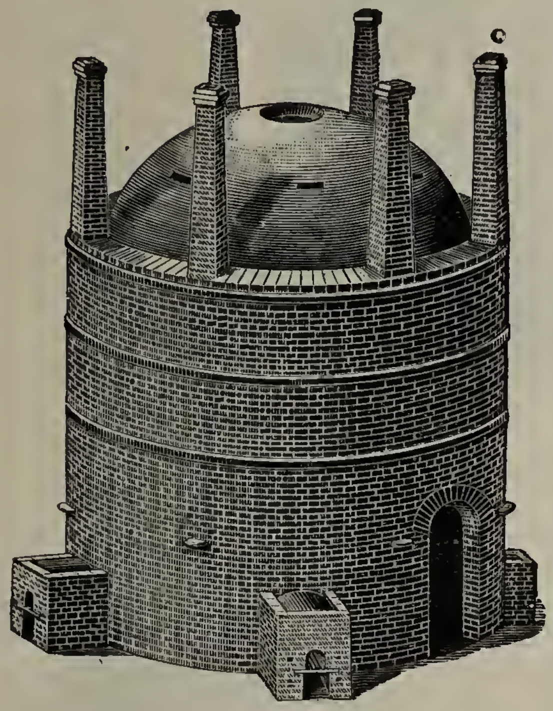
☞For descriptive circulars, additional testimonials, and all information desired, address

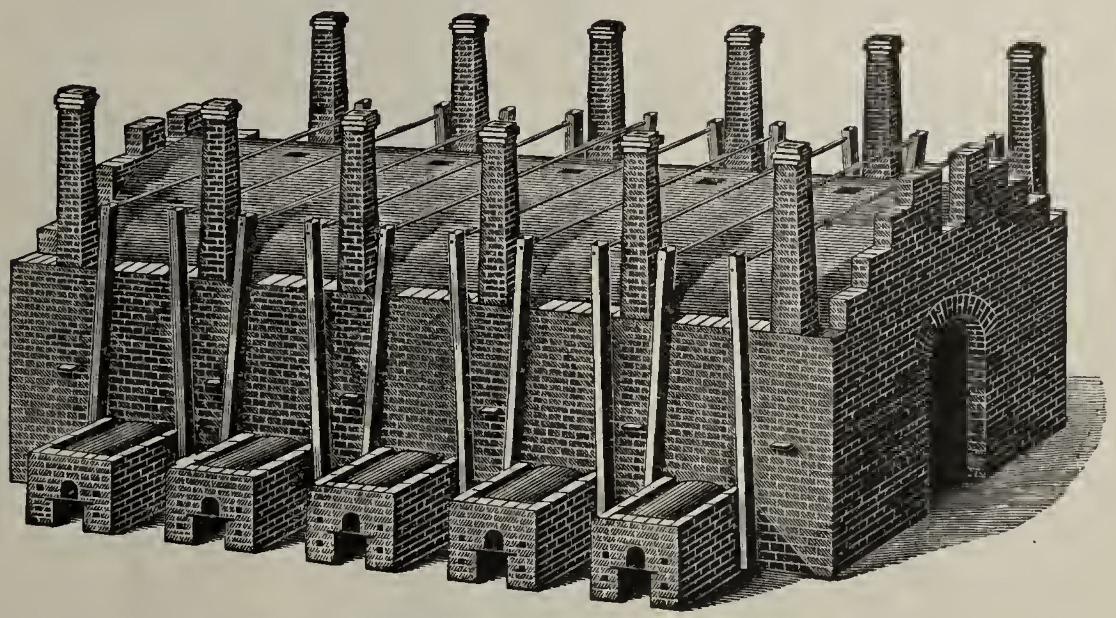
R. B. MORRISON & CO.,

Box 335, - - - - ROME, GEORGIA.

THE EUDALY KILN.

BURNS ANY KIND OF CLAY OR WARE





THE DOWN-DRAFT KILN.

UNIFORMITY IN BURNING is without a doubt the most essential feature to clay workers. Especially is this the case with fine clays where it is desired to have the wares of uniform color, size and hardness.

In the construction of these kilns particular attention has been paid to this point, by having first carefully examined the subject of drafts and the strength and nature of the different kinds of fuel. The size of the kiln, the size and number of furnaces, flues and chimneys must always sustain the proper relation to each other for a perfect draft. Too much draft is as dangerous as too little. One of the greatest mistakes of kiln inventors and builders is that they utterly disregard the important subject of drafts.

ABILITY TO DIRECT THE HEAT TO ANY PART OF THE KILN is equally as important as a proper draft. Unless the burner has control of the heat in the kiln he has no assurance of a uniform burn. In these kilns if the burner finds the wares too hot in any portion of the kiln he can in a moment shift the heat to any other part where it is not so hot, or what is better, if he has two or more kinds of wares in the kiln, one of which requires more burning than another, he can easily give that portion of the kiln an extra amount of heat. We claim that this is the only kiln in which these results can be attained successfully.

For this reason wares can be burned by this system **more uniformly** than by any other.

Practically there is no difference from top to bottom, yet this is purely a *down draft* kiln. There are no inside dampers or cut-offs. **Everything about the kiln is permanently built.**

ECONOMY OF FUEL AND LABOR is perhaps the second most important feature of any kiln. We hear a great deal said about "economy in fuel and labor," but to understand what is necessary to a fuel and labor saving kiln one should be thoroughly acquainted with all kinds of fuel and the conditions necessary to get the greatest number of heat units out of it, and at the same time **distribute the heat to the burning wares in the most effective manner.**

We claim that our latest improved furnace is the most **complete economizer** of fuel that has ever been invented.

The construction is purely scientific, and is made by first obtaining the chemical requisites necessary to insure perfect combustion and then building a furnace to bring about these results. Different kinds of fuel require a different size and construction of furnace. We use any kind of fuel, soft coal, screenings, oil, gas or wood.

COST OF CONSTRUCTION—These kilns require no large stack, which ordinarily costs as much as the kiln proper. Many persons think they must have a large, tall stack in order to have sufficient draft to get the bottom of the kiln burned.

This is certainly a mistaken notion.

The things that are required, however, are a correct location and size of furnaces, flues and chimneys with reference to each other and the kiln. When these are properly attained the burner need have no fear about draft.

In these kilns great care has been taken to adjust these relations in such a way that the expensive stack is not at all required, and a much better draft obtained.

DURABILITY.—Each part of these kilns is built with special reference to strength and durability.

The furnaces, which are perhaps the most perishable parts of any kiln, are in these kilns made very strong and durable.

Those parts most liable to burn out can be easily removed and replaced without damage to the other parts of the furnace.

Rules are given by which a builder of these kilns can get the strongest crown and best supports to the kiln.

SIZES.—These kilns can be built either **round** or **square**, and of **any** desired **size.** A number of these kilns are now in use that burn from **150** to **250** thousand bricks at a time. The walls are built **twenty-four inches thick.** They should be lined throughout with fire-brick where the clay is very hard to burn. Good kilns can be made, however, without using fire-brick for any part except the **furnaces** and **bags.** In asking for cost of construction **state size of kiln in feet wanted,** whether the kiln walls, crown or bottom are any or all to be lined with fire-brick.

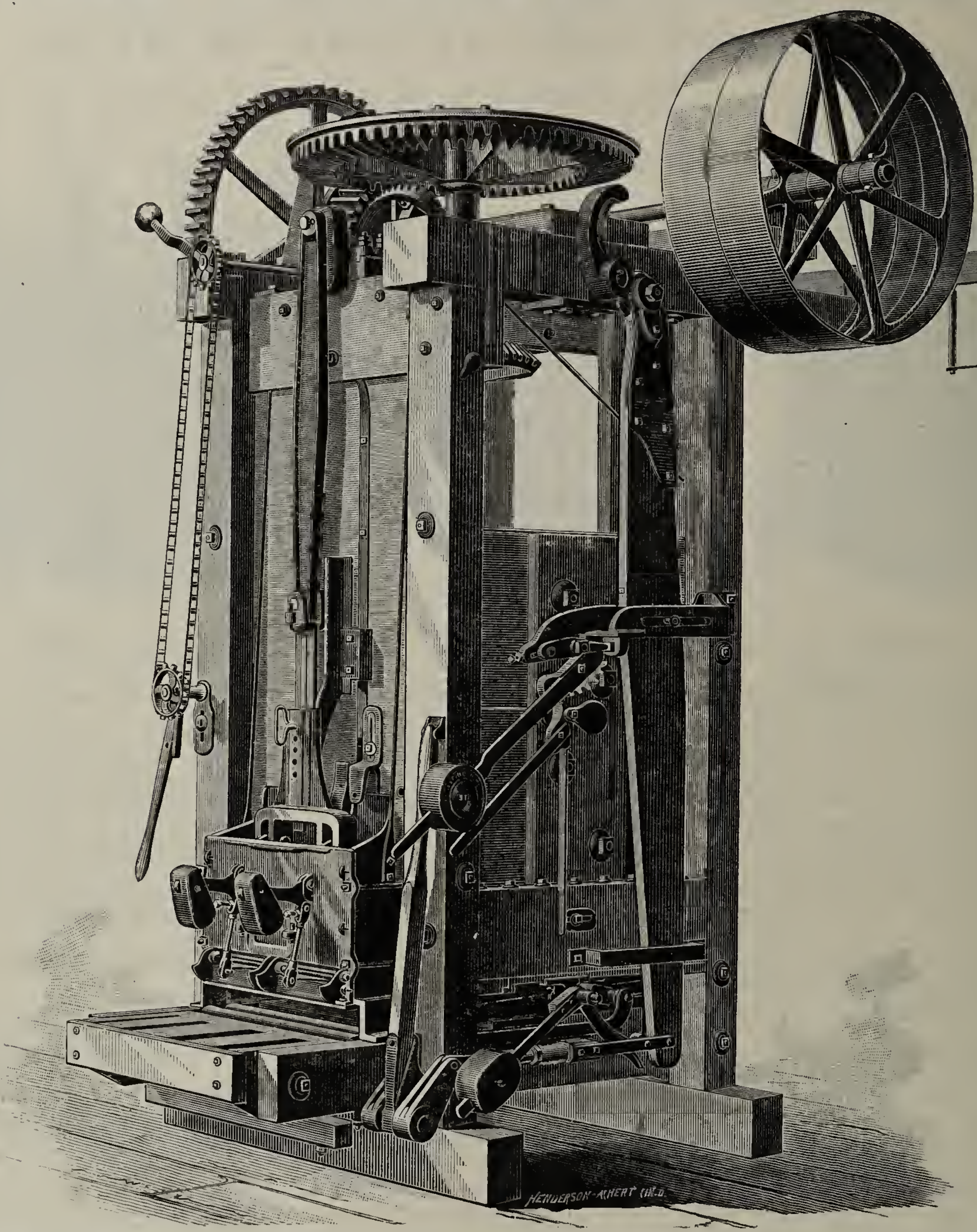
DRAWINGS and specifications for building kilns will be furnished any who purchase *kiln or yard rights.* We usually can urnish a man to superintend the building if desired.

For further information address

W. A. EUDALY,

64 Johnston's Building, - - - - CINCINNATI, OHIO.

The "Tiffin" AUTOMATIC Brick Machine


HENDERSON-ACHERT LITH.CO.

The "Tiffin" **Automatic** Brick Machine is, **beyond question**, the best machine of its class in the market. It is **Heavy, Strong** and **Durable. IT IS GUARANTEED TO DO GOOD WORK.**

The **"TIFFIN"** is made for use by **Steam**, or **Horse** power. The capacity of the **Horse Power Machine** is 18,000 to 20,000 per day, and of the **Steam Power** 25,000 to 40,000 per day, according to the speed at which they are operated.

Both styles are equipped with our **Automatic "Stone Doors,"** which permits a stone, or any other hard substance, that may have passed in with the clay, to pass out **without breakage to the Machine.**

PRICES:		
	Steam Power Machine	$350.00
	Horse Power Machine	$250.00

The principal shafts are of Steel, and all other material used, is **First Class. Competent Workmen Only Employed** in their onstruction. These machines have been **Thoroughly Tested** in the hands of **Experienced Brickmakers** during the past season, and with the most **Satisfactory** results to them. Parties who may be **Interested Enough** to wish to make inquiry, will be given the names and address of the parties who have had them **in** use.

We are the makers of the **CELEBRATED "OLD RELIABLE"** Brick Machine, for use by hand power, which is so well and favorably known to the Brickmakers of the entire country. We are also manufacturers of Turn Tables, Trucks, Wheel Barrows Molds, Kiln Doors, Etc., Etc. Correspondence solicited.

TIFFIN AGRICULTURAL WORKS,

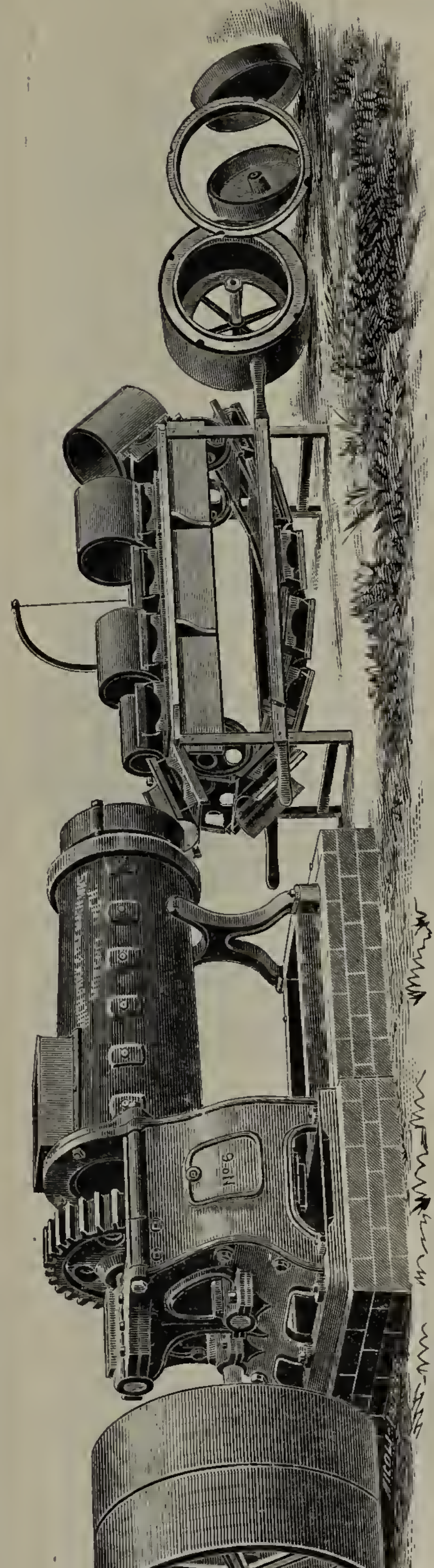
[Mention the Clay-Worker.]

TIFFIN, OHIO.

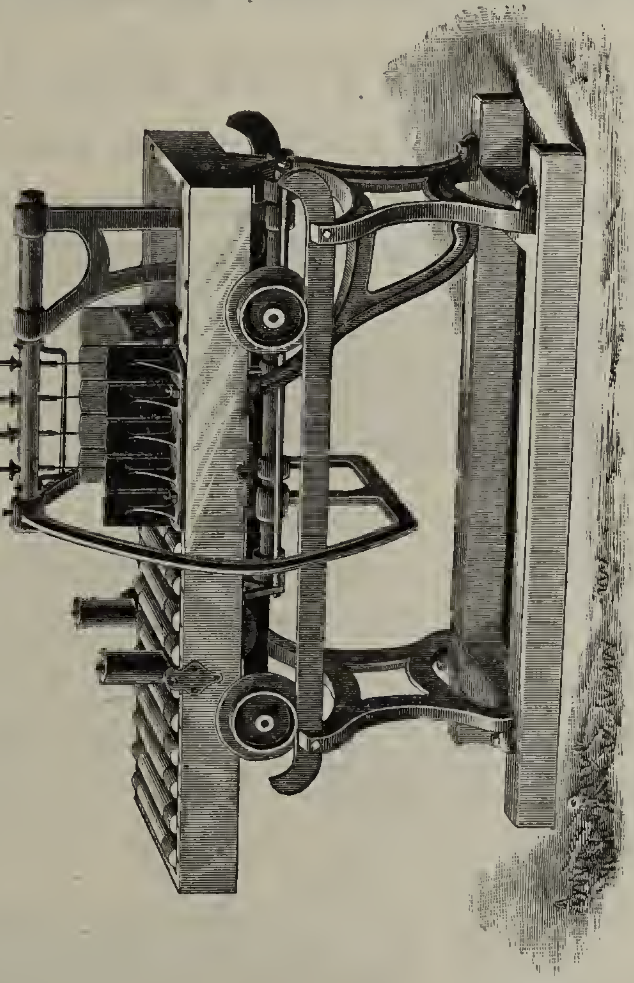
Michigan Brick & Tile Machine Works,

—MANUFACTURERS OF—

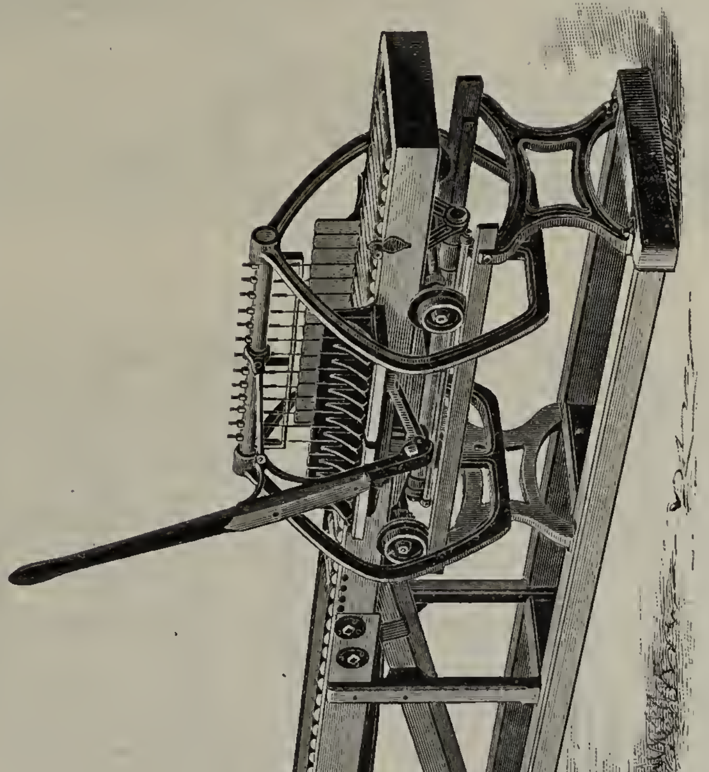
BRICK AND TILE MACHINERY.



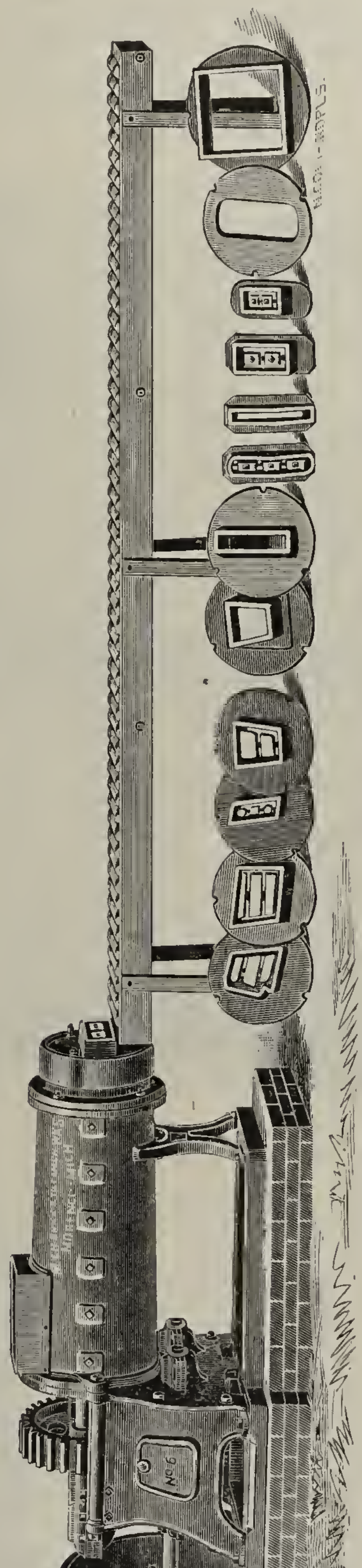
No. 6 Special Brick and Tile Machine.



No. 1 Curved Side-Cut.



Special No. 6 Curved Side Cut.



No. 6 Terra Cotta Lumber Machine.

☞Send for Descriptive Circular.

MICHIGAN BRICK AND TILE MACHINE WORKS,

Lenawee County, [Mention the Clay-Worker]. MORENCI, MICH., U. S. A

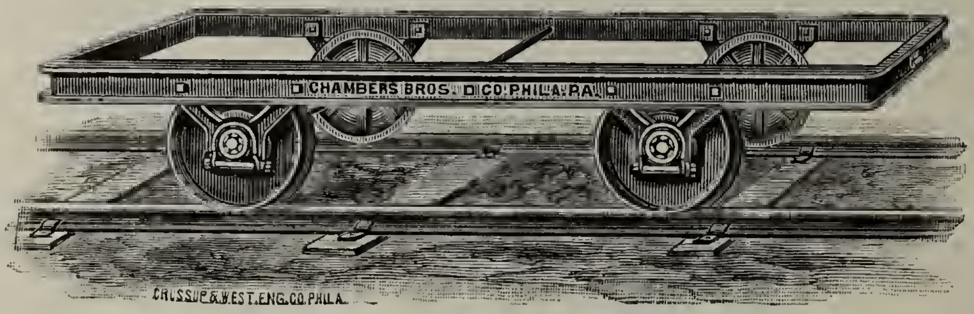
CHAMBERS BROTHERS CO.,

FIFTY-SECOND ST., BELOW LANCASTER AVE,
PHILADELPHIA, PA.

Improved Tunnel Dryers For Common Brick

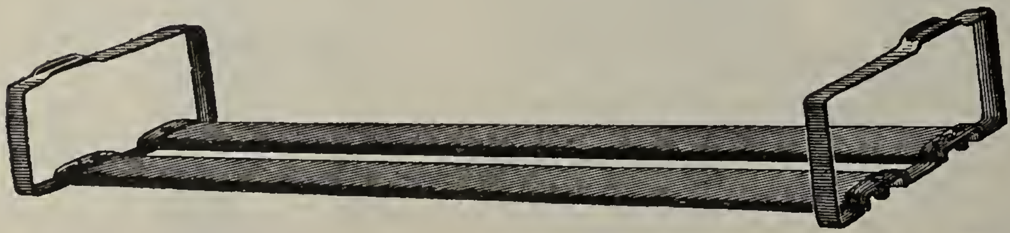
And the Most Durable and Complete System for Transporting Green Brick.

The Strongest Car Made.


CHAMBERS BROS. & CO. PHILA. PA.
CHESSUE & WEST. ENG. CO. PHILA.

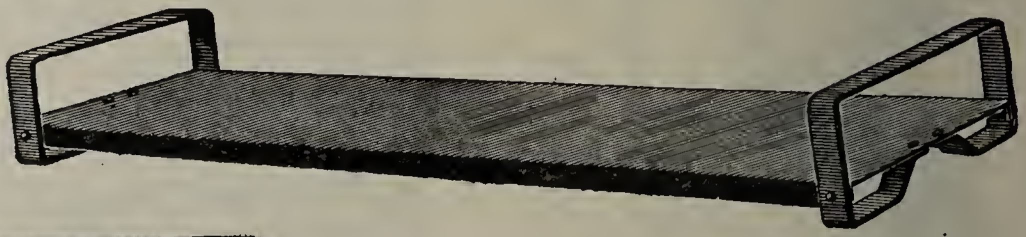
The Strongest Car Made.

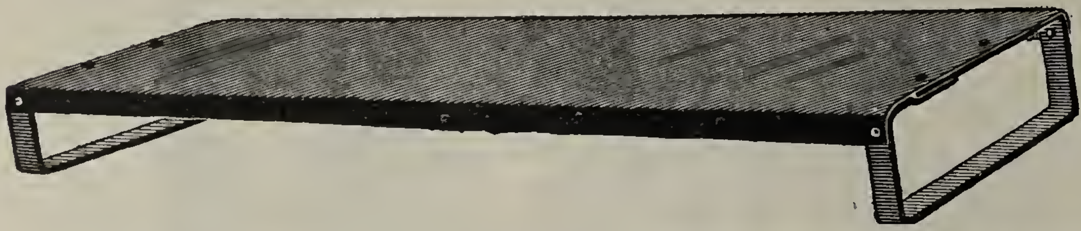
CHAMBERS' WROUGHT-BODY DRYER CAR.
A lower priced Car with cast iron bodies made to order.



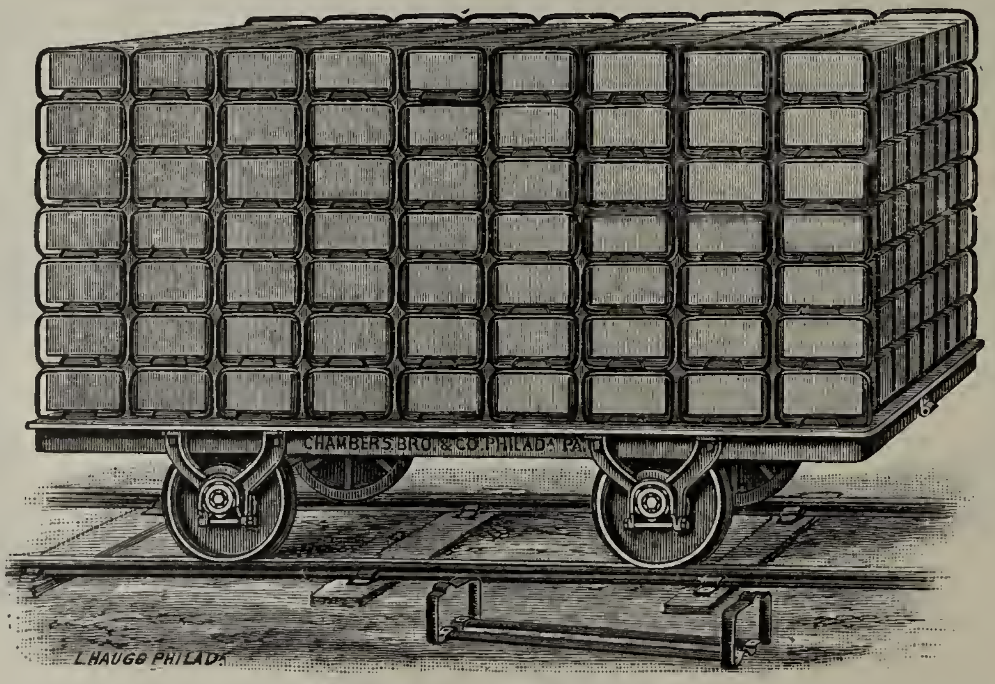
☞ Wrought Iron Interlocking Pallet for Stiff Tempered Brick only.

Steel Pallet for brick placed on flat side or on edge. ☞





☞ Steel Pallet for soft moulded brick, or those placed on flat side only.


CHAMBERS BRO. & CO. PHILADA PA.
L. HAUGG PHILADA

CHAMBERS BROTHERS COMPANY,

PHILADELPHIA, - - PA.

☞ See ad. on front cover page.

[Mention the Clay-Worker.]

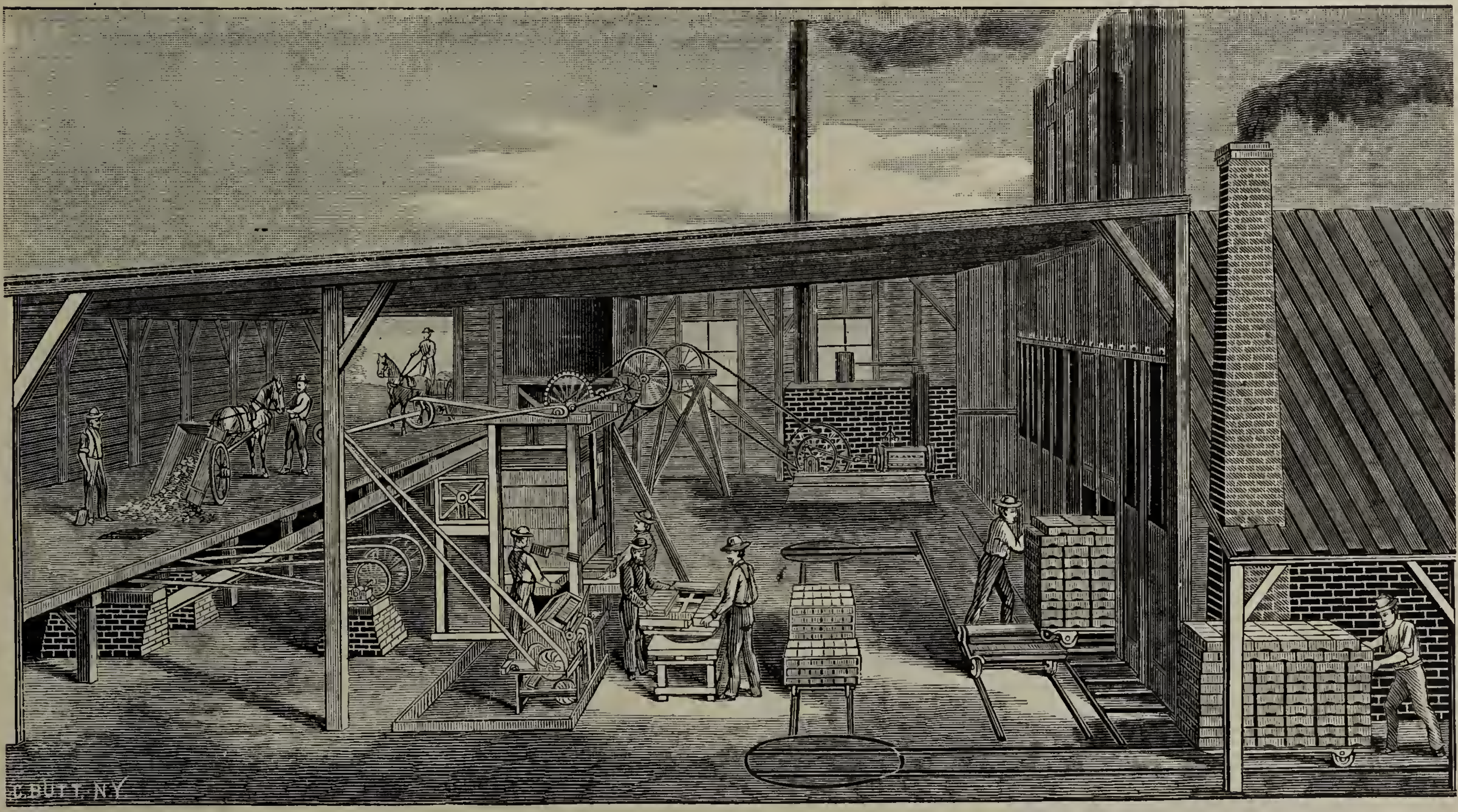
SHARER'S IMPROVED DRYER

* * *

☞ **More than one hundred now in use DRYING SUCCESSFULLY Soft Mud Brick, Stiff Mud Brick, Pressed Brick, Fire Brick, Hollow Brick, Tile, Plaster, Architectural Terra Cotta, Terra Cotta Lumber, Peat and Lumber.** ☜

* * *

☞ No other Dryer in existence can successfully dry such a variety of Materials. ☜



27 have been built the present season and are now in successful operation.

The Only Successful Soft Mud Brick Dryer in Existence.

Will also dry Stiff Mud, Semi-Dry and Pressed Bricks at 50 per cent. less cost than any Steam Drier.

No other Dryer will Guarantee to dry Soft Mud Brick. I Guarantee to dry any kind of Bricks.

It is not a Direct Heat Dryer, nor a Steam Heat Dryer. It is a Radiated Heat Dryer. The heat being produced from Coal, Wood, Coke, Oil, Gas or any kind of Fuel, and Radiated through Brick or Metal floor. The heat can be so graduated as to successfully dry the most Tender or Refractory Clays without damage. While in a Direct Heat Drier the product of combustion coming directly in contact with the material to be dried will warp, check and crack in most cases. In a Steam Drier the heat cannot be graduated. Neither can heat be produced from Steam near as cheaply as from the Fuel Direct. With a Steam Dryer it is necessary to run one or more Boilers and Exhaust Fans day and night. There is No Machinery whatever necessary to operate my Dryer. Hence the wear and tear and expense of operating is reduced to the minimum.

References and all information given by letter or otherwise. Address,

GEO. W. SHARER, Proprietor,

8 South Broad Street, Room No. 1,

PHILADELPHIA, PA.

ED. H. CALLAWAY, Gen'l Agent, 72 Reade St., New York.
E. A. KING, Special Agent, New England States, 48 Congress St., Boston, Mass.
HUGH CAMERON, Toronto, Ont., Special Agt. Dominion of Canada.

Improved Eureka Dry Press Brick Machine.

WEIGHT SEVENTEEN TONS.

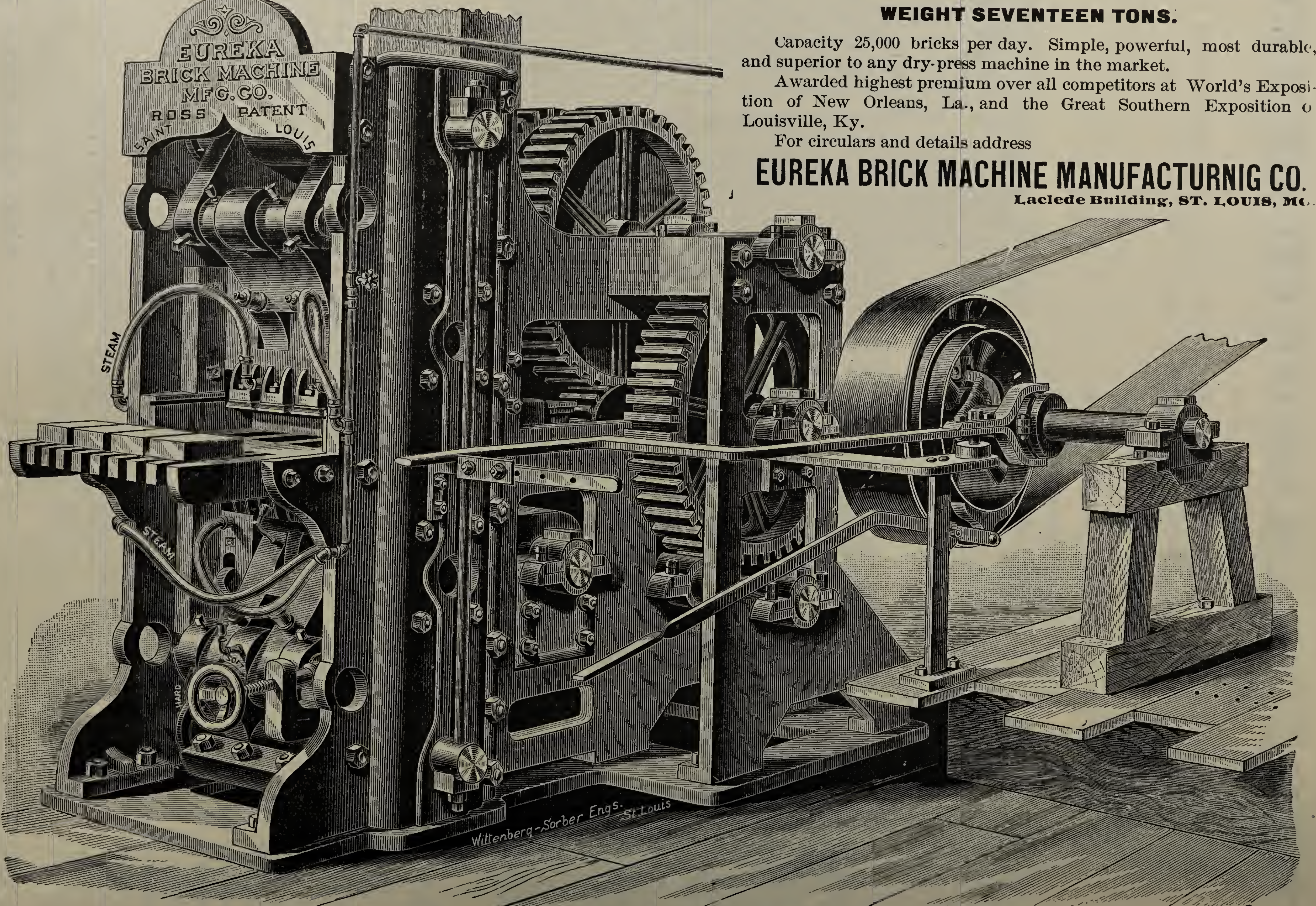
Capacity 25,000 bricks per day. Simple, powerful, most durable, and superior to any dry-press machine in the market.

Awarded highest premium over all competitors at World's Exposition of New Orleans, La., and the Great Southern Exposition o Louisville, Ky.

For circulars and details address

EUREKA BRICK MACHINE MANUFACTURNIG CO.

Laclede Building, ST. LOUIS, M



St. Louis Iron and Machine Works, Iron Founders and Builders of Heavy Machinery.

ESTABLISHED 1854.
INCORPORATED 1875.

Office and Works: Main St. and Choteau Avenue,

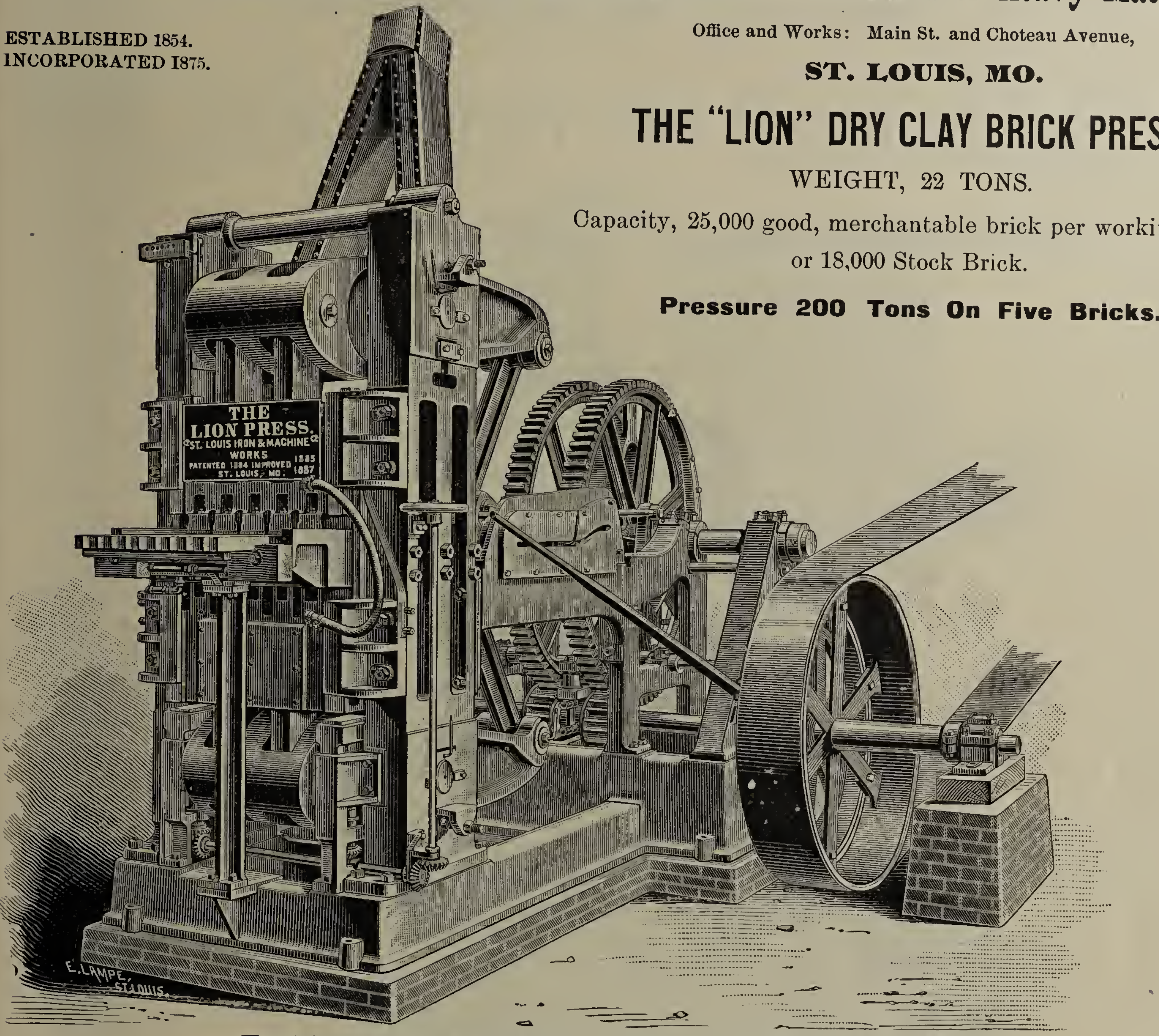
ST. LOUIS, MO.

THE "LION" DRY CLAY BRICK PRESS.

WEIGHT, 22 TONS.

Capacity, 25,000 good, merchantable brick per working day, or 18,000 Stock Brick.

Pressure 200 Tons On Five Bricks.



We claim the following essential features and advantages for our Machine:

1. The main feature of this machine is its great strength, power and durability. The pressure on each brick being 40 tons, and the working parts are so strongly constructed that there is no spring or give under this working strain. 2. The great simplicity and openness of framing and construction, so that every part of the machine is easily accessible for inspection, lubrication and adjustment, thereby reducing the necessary repairs, incidental to every Brick Press, to a minimum. 3. Pressing 5 bricks at each revolution of Machine, keeps the regular force of off-bearers and setters fully employed, which a 4 Brick Machine cannot do. 4. The adjustment of machine from common to stock brick and vice-versa, can be made in a few minutes' time.

Besides the Press, we manufacture and furnish a complete set of clay preparing Machinery, Elevators, Mixers, and Rollers; also Engines and Boilers complete. We also build different kinds of Steamboat Machinery and Steam Boilers, Corliss Engines, Cotton Compresses, Water Work Plants, Coal and Mineral Mining Machinery, Bridges Work, Hoisting Travelers, Cranes and Elevators; also general and large castings and Machinery. Any further information cheerfully given.

TESTIMONIALS.

St. Louis Iron and Machine Works, St. Louis, Mo. KANSAS CITY, MO., September 28, 1888.

GENTS: The two "Lion" Presses I bought from you about two years ago have given me entire satisfaction. As a dry clay press I think they have no superior. I prefer the "Lion" to the "Hydraulic". Ever wishing you success with the "Lion," I am,

Very Truly Yours, DRURY UNDERWOOD.

OFFICE OF
TENNESEE BRICK MANUFACTURING CO.,
NO. 7 MADISON STREET,
St. Louis Iron and Machine Works, St. Louis, Mo. MEMPHIS, TENN., September 28, 1888.

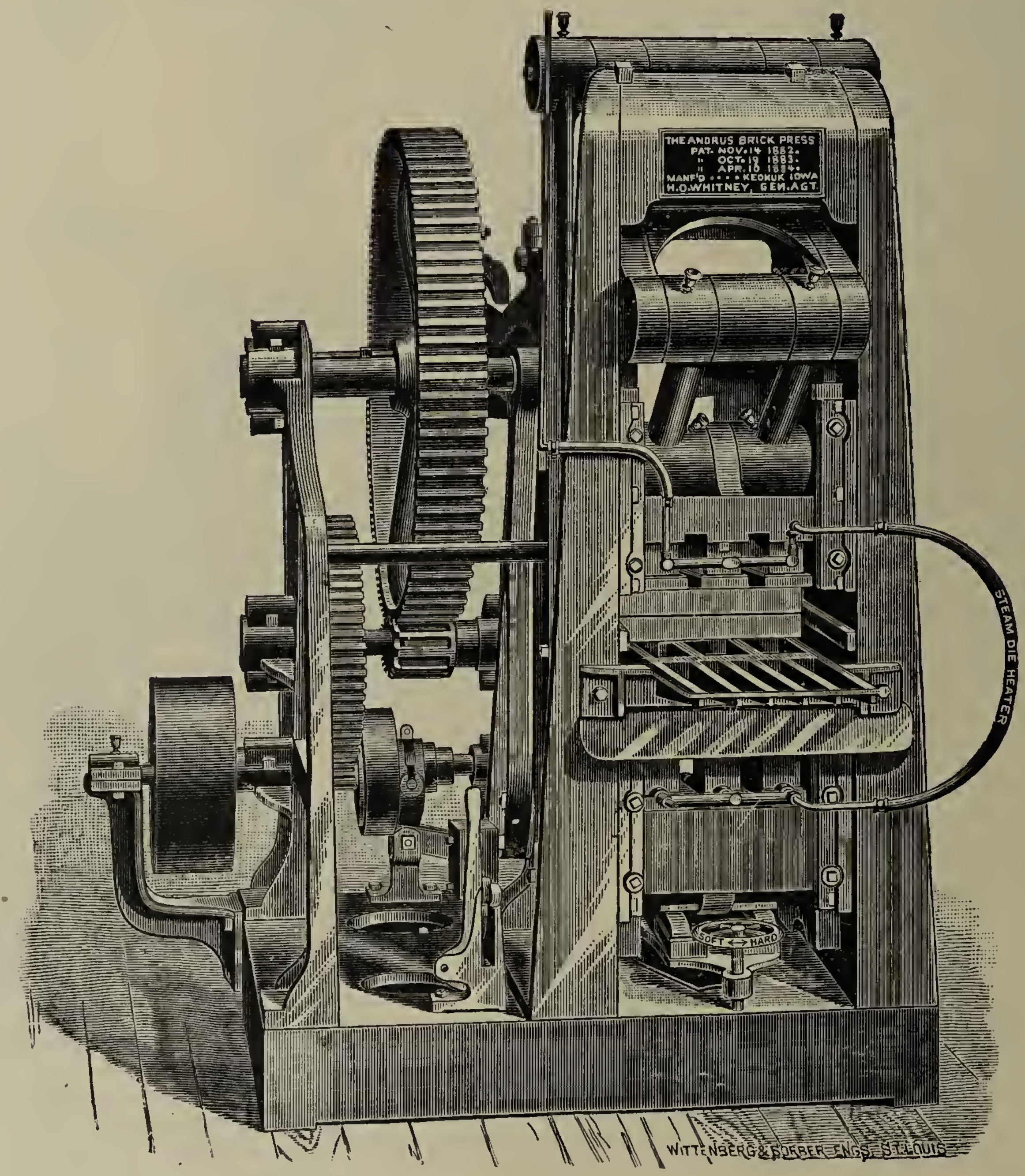
GENTLEMEN: In reply to yours of 25th inst., we beg to say that our Company contracted with you last spring for one of your "Lion" Brick Machines, having concluded, after our President and Superintendent had thoroughly investigated most of other machines, including the Hydraulic, that yours possessed more advantages and promised better results. In due course the machine was delivered, set up and put into operation. After having operated it all summer to full capacity, we are more than pleased with results and can heartily recommend the Machine to any one contemplating a purchase. To fully appreciate the merits it must be seen performing work.

Wishing you that eminent success which you so well merit we remain Yours Truly, C W. EDMONDS, Sec. and Treas.

—THE—

Improved Andrus Double Pressure Brick Press.

UNRIVALLED FOR SIMPLICITY, POWER AND DURABILITY.



Our new **4 Mould Machine** has a capacity for 25,000 pressed bricks per day. We build at our own Factory Two, Three and Four-mould Machines which we guarantee in every particular.

For terms, etc., address

H. O. WHITNEY, Gen'l Agent,

General Office and Factory, KEOKUK, IA. (Mention the Clay-Worker.) KEOKUK, IOWA.

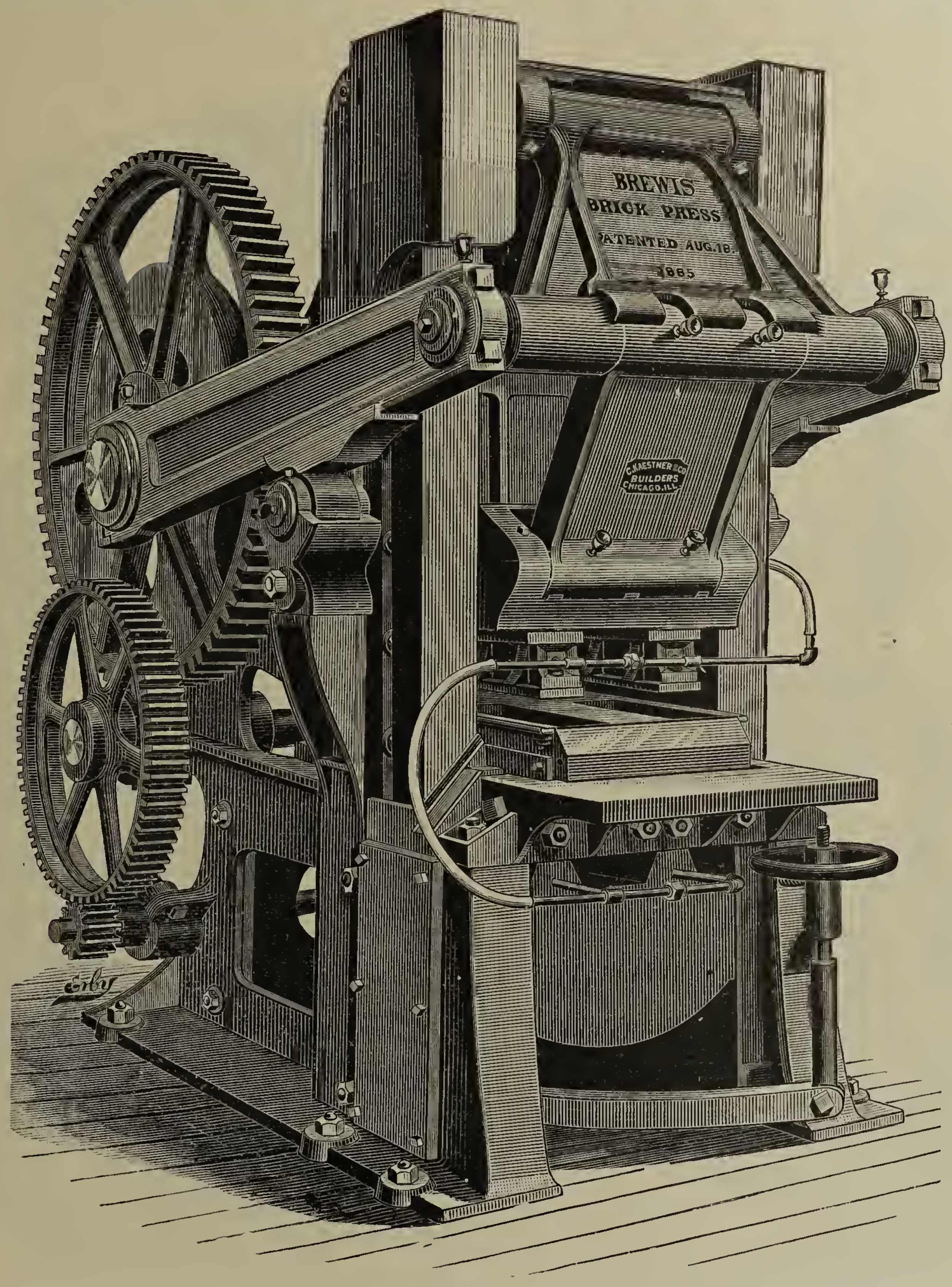
The Brewis Patented Brick Press.

SIMPLE AND DURABLE.

Guaranteed to make as many Perfect Brick per mould as can be made on any machine now in the market. We except none.

Fully covered by patents. **We protect our purchasers**

Capacity 8,000 to 16,000 a day depending upon the clay



Shipped to responsible parties on 30 to 60 days trial.

Guaranteed against breakage for Two Years.

We furnish the Boyd and Raymond Pulverizers at prices that defy competition. Send for Circulars and Prices to

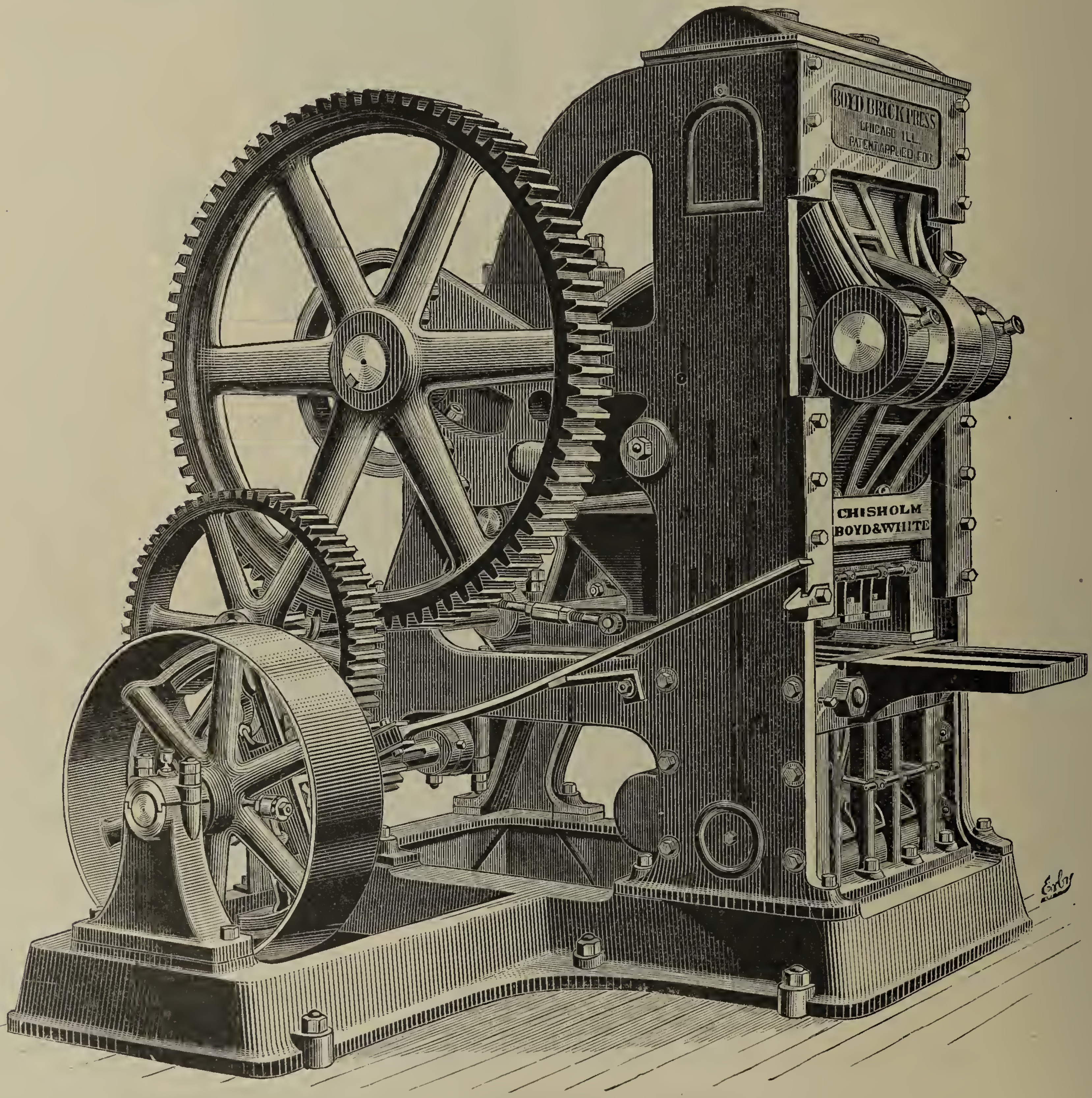
CHARLES KAESTNER & CO., Machinists and Founders,

ENGINES, BOILERS, PUMPS, SHAFTING, PULLEYS, HANGERS, ETC.,

[Mention the Clay-Worker.] **303-311 South Canal Street, CHICAGO, ILL.**

THE BOYD BRICK PRESS

Will make a greater quantity of Perfect Brick (of maximum weight) per mould for a consecutive number of days than any other Semi-Dry Brick Press in the world and Superior in Quality to Hydraulic Pressed Brick.

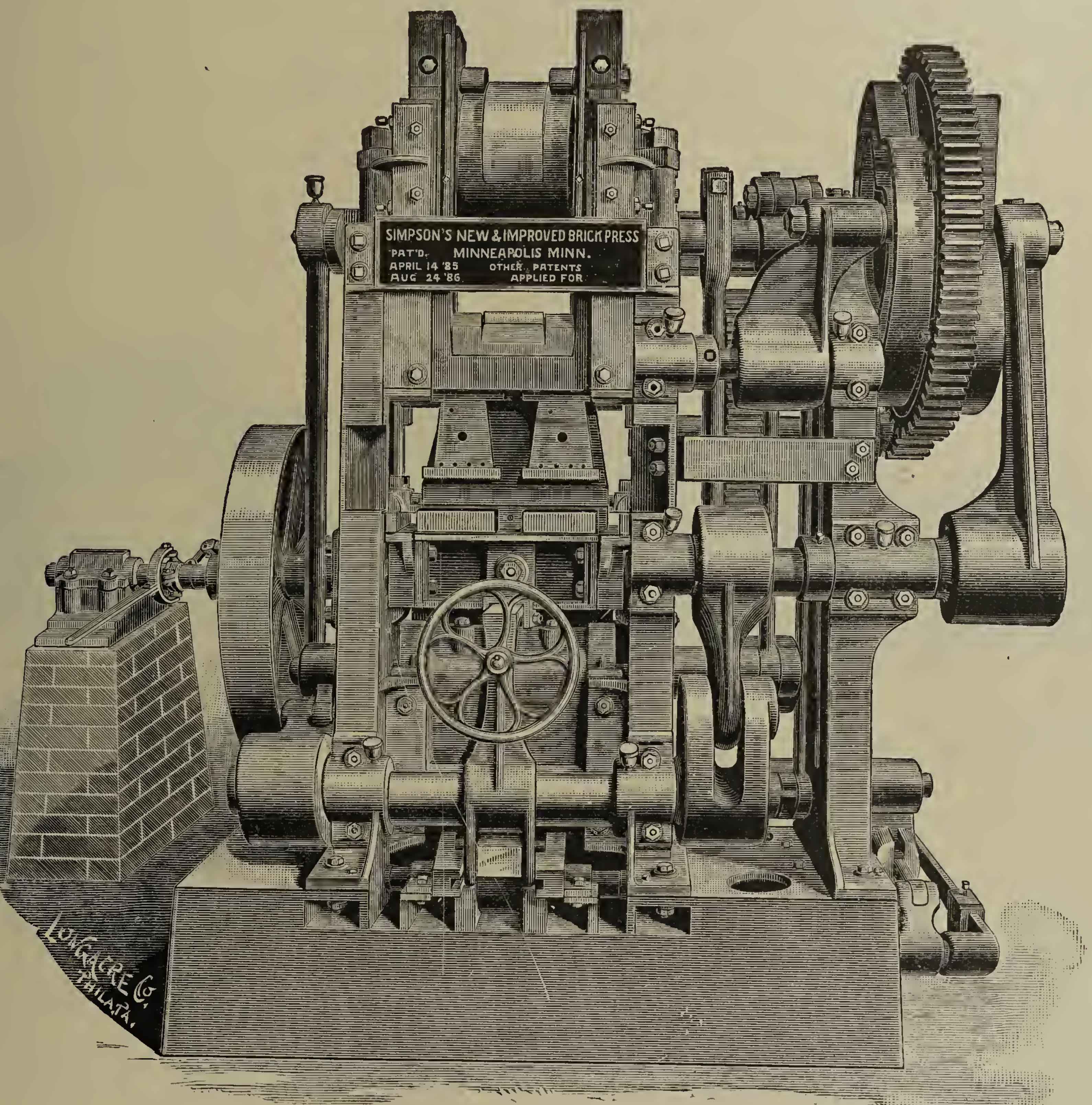


☞ Correspondence Solicited.

CHISHOLM, BOYD & WHITE,

86 Adams Express Building, CHICAGO, ILL.

SIMPSON'S NEW
AND
IMPROVED BRICK PRESS.



Send for particulars and prices

SIMPSON BRICK PRESS CO.,

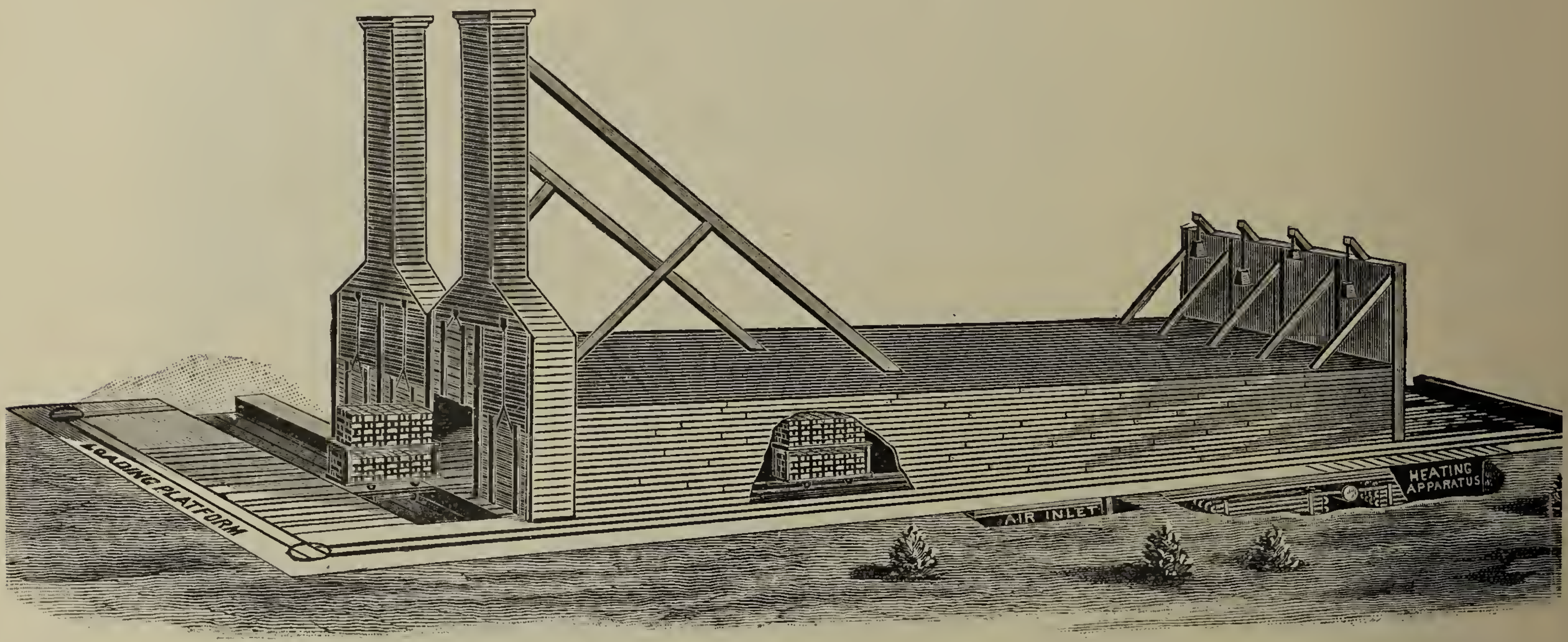
Room 91, No. 159 La Salle St., **CHICAGO. ILL.**

BRICK DRYERS.

We are prepared to erect Dryers to dry any clay.

YOU SAVE EXPENSE OF SHEDS.	NO FROZEN BRICK. . . . .
. . . . YOU WORK DURING ENTIRE YEAR. . . .	. . NO INTERUPTIONS BY RAINY WEATHER .
YOU SAVE TIME AND FUEL IN WATER SMOKING	NO DELAYS BY WAITING FOR DRY BRICK . .

WOOD BUILDINGS CHEAP TO CONSTRUCT



CHICAGO IRON-CLAD DRYER,

FOR ALL KINDS OF BRICK AND TILE.

This Dry House is a combination of the Drying Floor and Tunnel System. The radiation from the Iron Floor extending over the heating coils dries the lower tiers of bricks. The perforation of the Iron Floor gives an even distribution of the heat and prevents cracking. The steam heat is not so intense as to melt down the bricks or bake them. The bricks are dried smoothly and burn evenly, with a good ring. The water smoke is drawn off as rapidly as made, and the drying is even and gradual. Stiff mud bricks are hacked on double-decked cars. Soft mud bricks are dumped on pallets and cars carry the same through Dryer. Semi-dry and dry pressed bricks are specially provided for and can be dried without injury. Our buildings are constructed entirely of wood; are simple, cheap and easily erected. We furnish complete steam heating apparatus with pipes connections, Iron Cars, Turn Tables, Transfer Cars and Rails. Confer with us before contracting elsewhere. We will save you money, time and trouble. State character of bricks made, name of machine used and capacity required.

I. & M. WOLFF & COLEMAN,

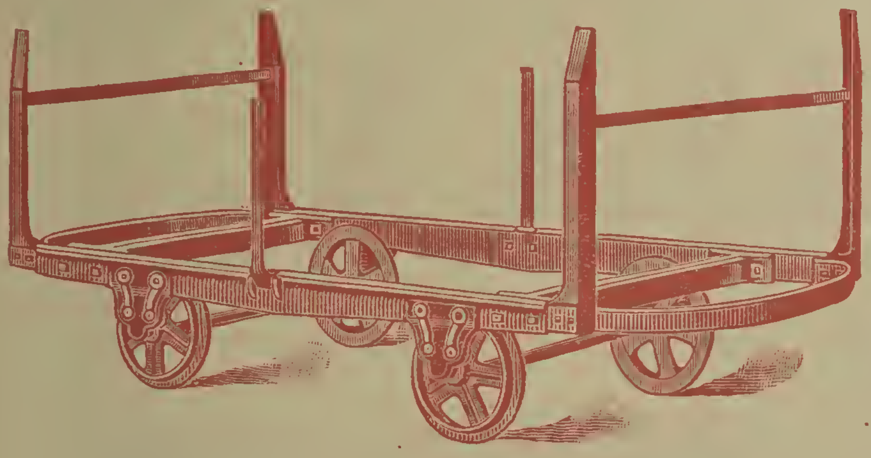
PATENTEES AND SOLE BUILDERS,

Write for catalogue.

No. 261 Dearborn St., Chicago, Ills.

The Iron Clad Steam Dryer.

It will pay you to have your bricks thoroughly and equally dried before setting in kiln. You can dry them more economically in our Steam Dryer than in the kiln, besides getting a more uniform burn and better bricks. Handling and wheeling bricks costs money and the bricks are often marred and in bad shape when they go to the kiln.



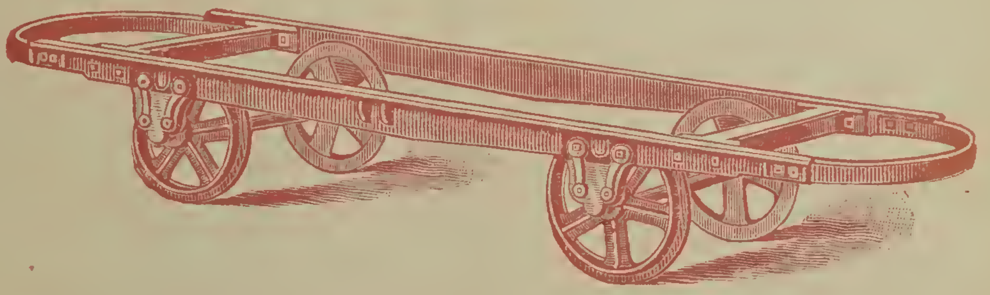
No. 1.

These trucks are strong and well made throughout, and the axles run in anti-friction rollers and are easily handled by one man:

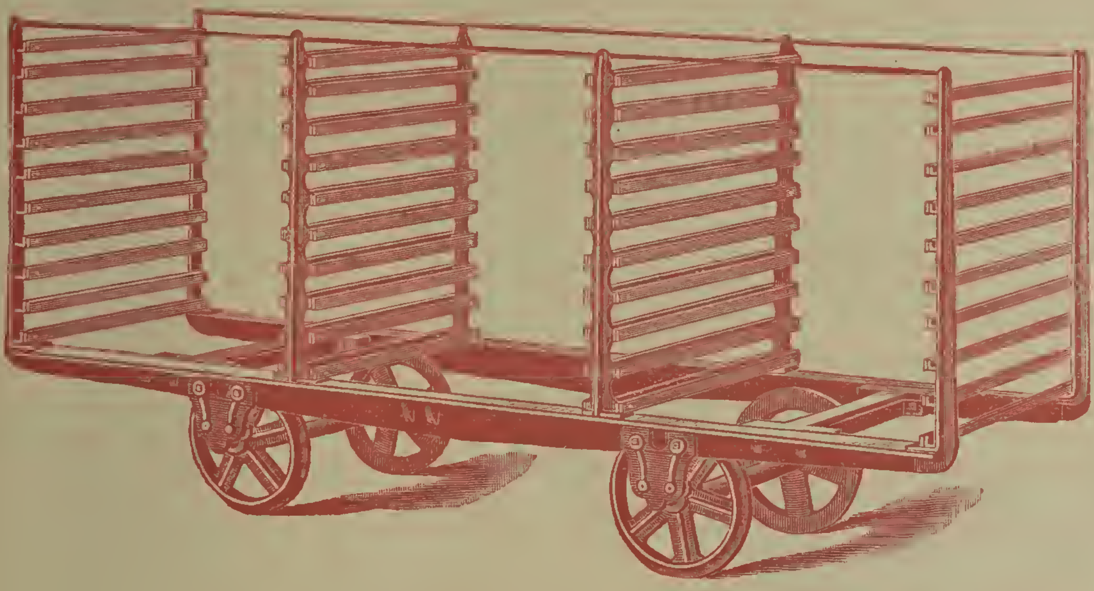
Cut No. 1 shows our double decked car, which we use for all the varieties of brick, sufficiently stiff to be hacked; on the lower deck of which we hake four tiers high, and on the top deck, five. This car is suitable for all of the stiff mud brick made by the various Die machines. It is also adapted for the drying of dry pressed and semi-dry pressed bricks.

Cut No. 2 is a simple frame car which is used for foot pallets, or this car can be converted into car No. 1 or 3.

Cut No. 3 is for bricks that are too soft to hake and when pallets are necessary.

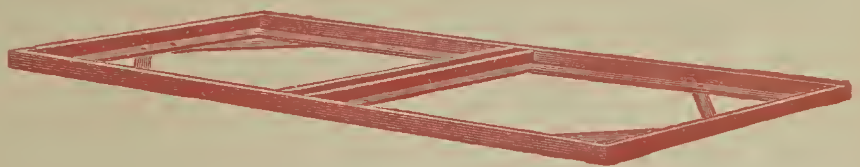


No. 2.



No. 3.

These racks, together with the car, are constructed entirely of Iron. They will be found stong, light and durable, and afford the best method of using pallets. They do away with the use of the foot pieces on the pallets which are so much annoyance in handling. The pallets are made to slide upon the wrought iron bars, which act as braces for the posts. We make these racks for the pallets to slide in lengthways of the car, so as to bring the side of the bricks towards the heat and also afford conveniencies of putting in and taking out the pallets. You can reach across the car easier than lengthwise of it. These cars are 8 feet 6 inches in length, and 34 inches wide.



No. 4.

Cut No. 4 is a substantial as well as a light frame—made entirely of wrought angle iron and strongly braced, which is to be used for a top deck in the car in cut No. 1. ADDRESS

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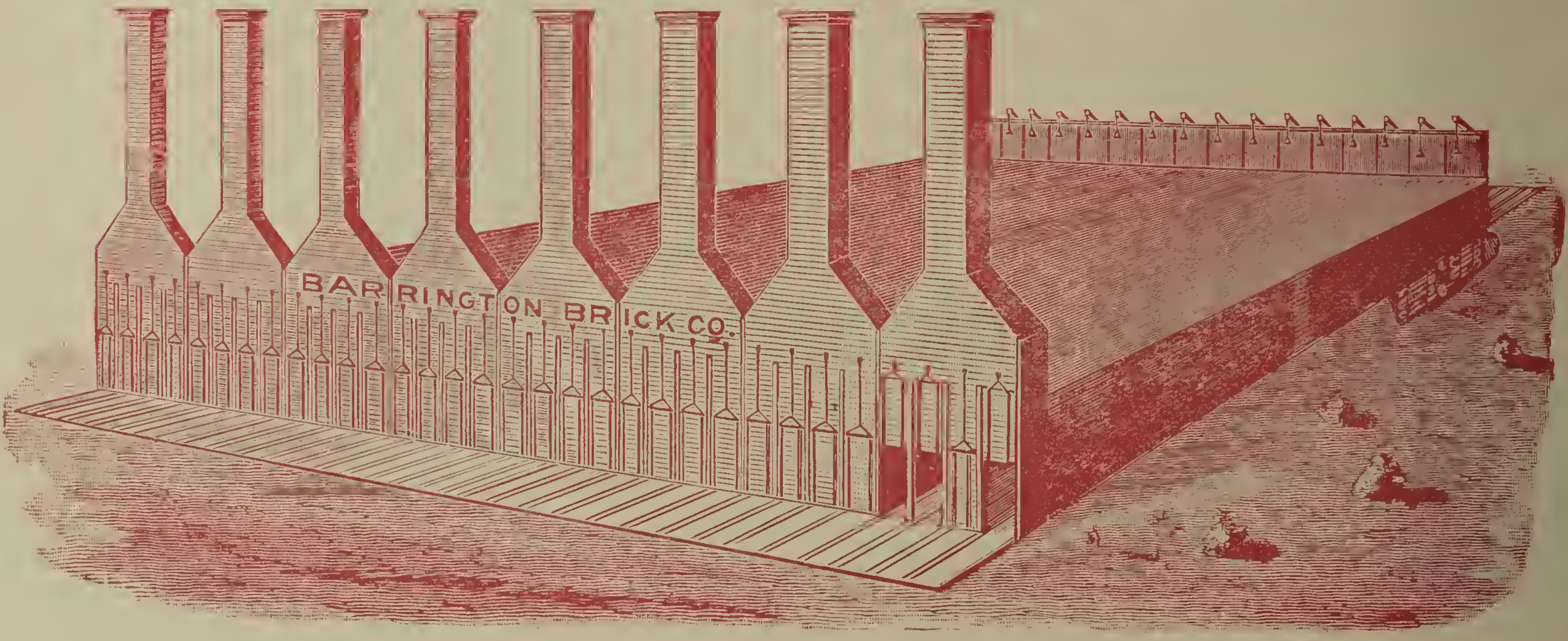
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GENTLEMEN: We have deferred answering yours as we desired to get a full test of the Dryer, and now will say to you that we have had the Dryer in *successful operation* for several months, giving us a *daily capacity of* 75,000 *bricks.* By its use we are not interrupted by weather, and in addition to the money we save in handling, we get a less percentage in breakage than by any other method. We believe that steam heat is the proper principle to dry bricks as it seems to dry more uniform than furnace heat and we can control the drafts and temperature better than we could in any furnce dryer.

The wear and tear on the Dryer and on the cars is very small in our Dryer, and the bricks are in first-class condition and being well dried, we save time and fuel in shortening our water-smoking. We are more than pleased with the Dryer in every particular and would recommend it to any brickmaker who desires to get first-class results. To fully appreciate this Dryer parties should see it in operation, and to any of these we would be glad to show our plant. Yours Truly, W. K. LOGEE, General Manager Barrington Brick Co., Barrington, R. I.

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THE CLAY-WORKER

Vol. XII. INDIANAPOLIS, IND., NOVEMBER, 1889. No. 5

Written for the Clay-Worker.

EXAMPLES OF AMERICAN BRICK AND TERRA COTTA WORK.

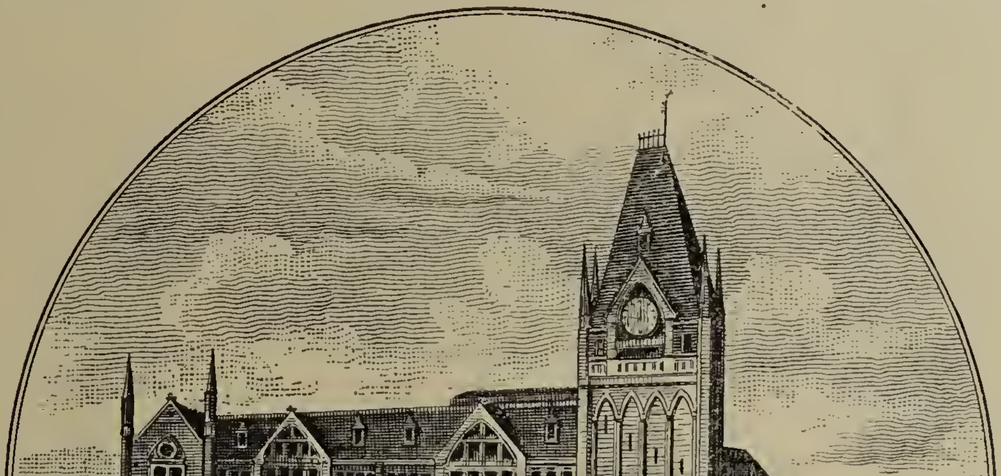
No. 21.

The Broad Street Passenger Station.

The Philadelphia terminus of the numerous lines of the Pennsylvania Railroad, was opened to the public in January, 1882, and is now well known throughout the country.

The arrangement is peculiar, owing to the fact that the railroad tracks, after crossing the Schuylkill River, are carried on a brick arcade along the south side of Filbert Street, at a considerable elevation above the street, and enter the station at a level of the second floor. The first story thus becomes a kind of basement and is so treated architecturally.

The front on Broad Street measures 193 feet 5 inches, and the depth on Filbert Street is 122 feet 10 inches. On the right, about 80 feet of the frontage is occupied by ticket offices, baggage room(departing),30x73,and a lobby, 40x80, for passengers in connection therewith, which lobby contains stairs and elevators to the waiting-rooms on second floor. On the left, about 34 feet is occupied by the exit staircase, behind which is the baggage room (30x80) for arriving baggage. The central portion about 80 feet is left open from front to rear providing for carriages to which passengers have access from either street under cover.



Pennsylvania Railroad Passenger Station, Philadelphia.
Wilson Bros. & Co., Arcihtects.

In the second story the entire frontage on Broad Street is occupied by the ladies' waiting-room (29x80) with private room (13x28) and toilet attached and the dining goom (29x74.) The restaurant (40x50) opens from the dining room and is served by private stair and dumb-waiters from kitchen above. The general waiting-room (50x80), adjoins the ladies' waiting-room and the restaurant. It is approached by the entrance stair and elevators from first floor and opens on the train lobby (30x190), extending the whole length of the building on rear (Fifteenth Street) and communicating with trains by gates. The exit stair descends directly from this lobby, and a baggage lift is provided at each end, connecting with the baggage rooms for arriving and departing baggage. The offices in the upper stories are approached from this lobby by a private stair and passage on the Filbert street front which also affords access to the toilet rooms for gentlemen. The train-house which begins at the gates from the lobby, extends about 450 feet in length to Sixteenth Street, being carried across Fifteenth Street on girders. It contains eight passenger tracks and platforms.

The style of the building is a modern adaptation of Gothic architecture. The eastern or principal front is divided into six unequal bays by piers and buttresses flanked on the north by a clock-tower, and on the south by a gable, in which are the openings to the exit hall and stairs. The tower and two bays next to it include the ticket offices, lobby, entrance stairs, etc., the other bays being open through on the street level, so that carriages may drive under.

The piers are carried up, from their granite bases, in terra-cotta as far as the springing of the large windows of the second story, the jambs of which are decorated with slender terra-cotta columns, two to each side with enriched shafts and caps, from which rise the great arches of elaborate terra-cotta work in three orders.

The transom lights are kept rectangular, forming spandrels under the arches which are of terra-cotta richly decorated. Over the piers between these arches are circular panels containing finely modelled heads typical of the races of humanity, indicating the cosmopolitan character of the institution and its widespread benefits. The upper stories being occupied by offices of the company, are more plainly treated, and the openings are made smaller and more numerous to suit necessary subdivisions. At the level of the fourth floor a balcony is got in the thickness of the wall, the face above being set back and the line of the wall face below carried up by buttresses, through which openings are pierced, making the balcony continuous. Two of the bays of this front are carried up through the cornice and form gables, which contain windows, lighting an attic story extending over the whole building and serve to break the otherwise long lines of the cornice. The front on Filbert Street is treated in a similar manner, extending from the clock tower to the bridge crossing Fifteenth Street and connecting with train-house.

The granite work is executed with extreme simplicity, the blocks being large, and the natural unworked surfaces being used wherever practicable. The mouldings and enrichments there used are bold and simple in character. The terra-cotta work, on the other hand, is very elaborate. The individual pieces are small, and plain surfaces are avoided as much as possible, to obviate the difficulties met with in manufacturing large pieces and the bad effects of warping and shrinking. Delicacy and elaboration of detail naturally follow, qualities which characterize the ancient Italian work and also the best modern English essays in this material. The red brick is relieved by bands of moulded brick of the same color at intervals, which serve to break agreeably the plain surfaces without destroying the solid effect. The interior is thoroughly carried out in the same style as the exterior.

Written for the Clay-Worker.

BRICKMAKING AND BURNING.

No. 7.

BY J. W. CRARY, SR.

[Copyrighted.]

A fixed national standard for the size of brick is of so much importance, that the entire brickmaking interests should concentrate in a movement to accomplish it. There are scarcely two manufacturers in the same place who make brick of equal size. There are many serious objections to this unnecessary difference. It has been said that it arises from the difference in the shrinkage in the clay. This is true where the same size of molds are used in different clays, but why not make the mold or die to suit the clay? After one kiln of brick has been made of any peculiar clay, it is easy to see what size the mold should be, to make a certain given standard size of brick. The best size of bricks for convenient handling, and easy drying, without flaws or cracks, is about 8½x4⅛x2¼ inches. This gives nearly 80 cubic inches to a brick which should be the standard size.

THE ADVANTAGES OF A STANDARD SIZE.

1st. Builders could use any make of brick in the same wall. 2nd. The transportation and hauling under similar circumstances would be the same. 3d. A fixed rule could be established for making estimates for brickwork. 4th. The most important manufacturers would not be trying to get the advantage of each other by changing the size of their brick and the buyers and consumers of brick would not be imposed on by having to take a small brick when they expected a larger one. There is no advantage in making a large brick. A brick should be made that will dry quick, heat quick, burn quick, cool quick, and just large enough for an ordinary hand to grasp two. If a man who is pitching brick has to take one in each hand, he loses time, but if he can grasp two with one hand he can work with ease and handle two about as quick as one. So with the "setter." If he sets skintling or zigzag, he can put down two bricks in right place with one hand. I have often set brick as fast as two pitchers could well and easily pitch.

2¼ inches is thick enough for a brick. A thin brick will carry more weight or pressure in proportion to thickness than a thick one for the reason that when a brick is crushed by pressure it, will fracture so as to leave a cone, the vertical slope of which will be in proportion to thickness, so that a wall built of thin brick and best cement mortar will carry more crushing weight than one built of thick brick. I would suggest that the National Convention of Brickmakers be held at some central point and the whole subject of size and manufacture be discussed and decided upon.

A CONVENTIONAL UNDERSTANDING FOR SIZE AND QUANTITY OF BRICK A NECESSITY.

To have the best and most reliable brickwork and building, it is of primary importance that some uniform, authorative rule shall be fixed for the size and strength of a brick and also for its capability to stand fire. It would not be necessary to fix a standard that would require the best and strongest brick, for it would be impossible to supply the demand. There are, comparatively, few clay beds that will do to make the strongest kind of brick or clay goods of any kind, so the standard brick would have to be such as could be made of fair, average clay of the country, and if better than the standard brick should be needed and required for some special work, the best clays would have to be used. All brick laid on the outside of a wall should have such fire qualities as would stand the heat of a burning building. A well built "party wall" as well as outside wall, should stand fire so that the brick will not scale or shell off. There are many kinds of clay that will stand great heat, but will shell off; such, for instance, as the clay bordering on Lake Ponchatrain near New Orleans, La. All this kind of clay should be well pulverized and pressed dry enough to go right into the kiln, then it will stand fire nearly equal to good fire brick and the brick are much stronger than if made of soft tempered clay. If brick walls have good foundations and are well built, they will stand intact after the building is burned and can be used as at first.

Some architects have said that no wall will stand a fire and be as good as at first building. Most architects know more about drawing a picture of a house than they do about the real, true art of building it. As I said in my first article, I am at home on a building with trowel in hand, and I always insist on having my own way about setting joists or any other timber going on the walls. I do not think a man can claim to be a first rate brick layer, unless he can set wood work or iron work on his walls so that when the building burns down, the falling timber or iron will not pull down the wall. Joists should be cut with a bevel at each end so that there will be a good bearing at the bottom and not more than two inches of the wall left resting on the top. If iron anchors are needed, they should be thin and wide as the joists are thick, and flat on the bottom of the joists, so that when the joists are burned so as to fall, they will hang to the wall or pry out the brick. Fires all on one side of a wall will expand and curve it a little, but as soon as cool, if well built, it will readjust itself and be as good as when first built. I have said this about the proper use of brick because there are many good brick that have to stand silent and defenceless and bear the sins of botchers and the aspersions of novices and the slander of ignorant and captious critics who never had sufficient intelligence to get a respectable introduction to a brick.

BRICKMAKING AND BURNING SHOULD BE A PROFESSION.

The public, generally, will never be able to get a first rate brick until there is a good supply of well trained, intelligent and thorough makers and burners. The fact that a man be an old brick burner is no guarantee that he can invariably produce a first class kiln of brick There are many old burners who look upon brick burning as a matter of luck and when they make a very excellent burn they speak of it as something out of the ordinary course of events when, in fact, they happened to follow the well known causes which produced their natural effects. If a brickmaker and burner thoroughly understands the nature of his clay and fuel, and how to use both to produce the desired results, he can be as sure of a good burn as of anything else. There is no occult art or secret about burning brick when all conditions are filled, which an intelligent understanding and good, practical judgment will suggest.

WHEN, HOW, AND WHERE, CAN A MAN LEARN TO BE A FIRST CLASS BRICKMAKER?

He can learn any other art at any place where it is practiced, but he may learn to burn brick at Philadelphia, Baltimore or any other single place, and if he should go to some other place where the clay is materially different, he would be a mere novice. Then what shall he do to get the art of brick burning so as to be master of it? Until there be a school or university for teaching the art in all sorts and kinds of clay, fuel and kilns, the only possible way to master the art is to visit all the good brick factories in the whole country where the clay is different or peculiar in its nature. He could work at each place long enough to see a kiln set and burned. It would probably take him five years, supposing he had the intelligence, perseverance, industry, physical energy and aptitude to thus pursue this art. As I have said before in these articles, the phenomena always arising and presented by varied and various experience in clay-working is so manifest, that it will be a long time before the world will be able to exhibit or point to a perfectly finished clay-worker but we can have first rate brick for any purpose if the brickmakers will concentrate their efforts to accomplish the object.

One of the chief faults in the progress of the art of brickmaking has been, to consider the making of brick as the *primary* object when, in fact, it is the *secondary*. What is the use of having a brick machine that will make 100,000 brick for $100, if, after the brick be made, they are only half burned? What is needed now to make real valuable progress, is a plan to make a good supply of first rate *brick burners*. A man may invent a good brick kiln or machine and then not be able to demonstrate it by his own skill. The success of "Dry Press" Machines has been greatly retarded by incompetent brick burners.

Written for the Clay-Worker.

WHAT CLAY HAS DONE FOR HISTORY

BY PROF. R. T. BROWN.

In the age of superstition there was a mythic story of a magical mirror which, on one side, at the bidding of the magician, would be shown any of the events that mark the past history of our race, and on the other could be pictured the future of persons or of nations, as the conjuror might will. We have nearly realized this wild fancy, at least so far as relates to the first side of the magic mirror. Our mirror is made of clay! It consists of the resurrection of authentic records of events which had been entirely lost to history, or had been, by the critics of this age, relegated to the domain of fabulous history. These events are inscribed on tablets of clay in the ancient Assyrian characters.

Near the close of the last century a school of critics appeared in France, and later in Germany, whose mission was to cast a doubt on all that remained to us of the history of antiquity. They began by an attack on sacred history, but not satisfied with, what they supposed to be a successful assault on Jewish history, they discovered that the laws of criticism which they had adopted in this case would be equally fatal to all the annals of ancient history. Berosus, Thucydides and Herodotus were each, in turn, consigned to the domain of skepticism, or doomed as mere narrators of myths.

This spirit of distrust with regard to everything ancient extended down to the middle ages, and even approached so near modern times as to threaten the robbery of Shakespeare, of his well-earned honors.

This school of criticism was sapping the foundation of ancient history—indeed it was undermining all history; for the arguments with which it assailed the leading features of antiquity were equally fatal to all collateral evidence that might be adduced. The actual manuscript, if ever there were such, have perished centuries ago—the monuments of Egypt told only of the existence of a people far advanced in the arts; but who they were and when they lived were unanswered questions. The ruins of Babylon and Nineveh were dumb, or spoke only in a mysterious voice of an unknown people. If Berosus, if Herodotus or Strabo have written of the magnificence of these cities—if Jewish history has detailed the time and the character of these peoples, the critic has only to challenge the existence of such historians and refer the books ascribed to them to the genius of some modern forger, and demand the proof of their authenticity.

At this crisis Champollion appears as a student and interpreter of Egyptian inscriptions, and a reader of the hieroglyphic characters in which many of these were concealed. In the rainless climate of Egypt these were fairly preserved; but the triumph of the French archæologist bid fair to be limited to that climate. In other cities of antiquity, inscription on marble, or on tablets of brass, were so effaced by time and weather as to no longer be legible.

The exploration of the ruins of Babylon and Nineveh, undertaken by an English antiquarian society, unexpectedly brought to light, well burned clay tablets and cylinders covered with inscriptions in the Assyrian language, every letter of which was perfectly preserved, notwithstanding the march of centuries that had passed over them. This discovery excited the scholars of this age, and the researches into these treasures of ancient literature have, within the last ten years, been prosecuted with great energy and with astonishing results. Not only in the capitols of the Assyrian and Medo-Persian empires have these libraries of clay literature been found, but in the region of the upper Euphrates and ancient Mesopotamia, in Moab and in ancient Phonecia and Syria. The discovery of these ancient tablets is a recent event, but already have these earthen tablets and cylinders confirmed many statements of ancient historians, both sacred and profane, upon the correctness of which a doubt had been raised by the critics; and many problems in regard to ancient nations, and their relations to each other have been solved that were beyond the reach of solution in the light of our best historic records.

Herodotus and other Greek historians, aided by the light of Jewish history have preserved a fair record of the dynasties of ancient Egypt, but a night of oblivion had settled down on the more ancient empire of Assyria—the first and greatest of the four universal empires that have ruled the world. This darkness was relieved only by now and then an incidental remark of a Greek or Jewish writer, but the imperishable clay records are revealing the lost history of that most ancient empire.

The tablets have confirmed all that Herodotus wrote of the size and magnificence of Babylon, and the extent and power of the empire of which it was the capital. They have given us an Assyrian version of the unfortunate expedition of Senacherib to conquer Samaria; and their account of the conquest of Judea and the destruction of Jerusalem by Nebuchadnezzar, very nearly corresponds with the bible history of that event.

The mystery that has long overshadowed that ubiquitary people called the Hittites, in bible history, is likely to be cleared away by these Assyrian tablets. We learn from this new source of information that in its best days Assyria exercised dominion over the whole region from India, on the east, to the Red Sea and the Medittерranean on the west. This population was chiefly herdsmen shepherds, who, like other semi-civilized people, were broken into clans or smaller nations (for the word Hittite signifies broken), but whatever name the clans might bear the whole group were Hittites. Lately discovered clay cylinders refer the conquest of Egypt and the establishment of the dynasty of the shepherd kings to these Hittites.

But it is not my purpose to detail the revelations of this new discovery; but rather to bring into prominence the fact that the indestructible property of well burned clay has been the means of preserving the record of events and the history of nations that would have been forever lost but for this. It is, however, probable these nations on the great plains of the Euphrates resorted to clay as a writing material from necessity rather than from choice. But having mastered the art of clay writing, they used it for all important documents such as title deeds, contracts, diplomatic correspondence and historic annals.

It appears somewhat strange to us, that in the absence of stone or metal, fit to retain inscriptions, these early artists should have stumbled, apparently by chance, on the only absolutely imperishable material known to science to-day. But perhaps those brickmakers of Shinar had a more accurate acquaintance with the properties of matter than we give them credit for. At least, they have demonstrated that even in this world of change, the annals of history may be committed to a material substance that will defy the "tooth of time."

A question has been raised as to the reliability of the translation of these clay documents; but the Assyrian language being from the same root as the Hebrew, with which scholars are already acquainted, there is no serious difficulty in mastering these inscriptions.

These researches have but begun—what they may lead to, belongs to the other side of the magic mirror into which we have not yet looked. Enough is already known to justify the conclusion that history is indebted to clay for knowledge that it could not have acquired from any other source.

Written for the Clay-Worker.

HINTS ON BRICKMAKING.

No. 41.

BY "R. BRICK."

HOW TO CONSTRUCT A FLOOR DRYER TO UTILIZE EXHAUST STEAM.

An excellent floor dryer can be constructed in the following manner to use either exhaust or live steam or both:

Grade your floor with a fall of six inches in one hundred feet, have the highest end next the boiler, cover this surface with one-inch steam pipe, in 100 feet lengths; lay these lengths of pipe in parallel lines and six inches apart from center of the pipe. These pipes connect at right angles, with header pipes at each end. The receiving header, that is, the one nearest the boiler, connects with a pipe which in turn is connected with the exhaust pipe. These three pipes should be of equal size and the steam should enter the receiving header at a point equally distant from each end, so the steam will be distributed equally through it. The header at the opposite end can be one less diameter. It should be two inches lower at one end than at the other. At the lower end place a globe valve a little smaller than the header pipe, with this regulate the volume of escaping steam and water. Some use steam traps, but these are no better than a globe valve of sufficient size. At either of receiving header pipes should be a one-inch globe valve, to drain this pipe. By placing a globe valve in the exhaust pipe above the point of connection with pipe leading to dryer the steam can be allowed to escape through it without passing through the dryer.

After pipes are laid and straightened there will be four and a half inches of space between the lines of one-inch pipe, lay a line of burned bricks with their ends together, so that their top surface is one-half inch higher than the pipes, fill space between the lines of brick with mud, covering pipes one-half inch, then over all lay a pavement "herring-bone" style, of smooth, hard bricks, bed them in mud as they are laid, they will be supported by the bottom bricks so that the pipes have no weight on them, and can expand and contract without breaking. The header pipe at the lower end should rest on skids so it can move when the pipes expand with heat and return when they are cold. The live steam pipe runs from boiler to exhaust pipe, and at night it can be used when the engine is idle. The heat is uniform all over these floors.

Where 25 horse-power is consumed the exhaust will heat a floor 50x100 feet or 5,000 feet of surface. On a floor of this size where live steam is used at night, so that the floor is not allowed to cool down at night, ten thousand soft mud brick can be dried every 24 hours, or of stiff-mud brick set on end 15,000 per day can be dried.

Pipes for a floor of this size fitted and put in place will cost about $800.00, and requires about 35,000 bricks.

Nearly all floors of this kind that have been built, did not have the pavement of bricks on top; some have only the string courses with mud between, this makes a poor floor, as the mud is soon cut out; others have tried cement with like results. All seemed to think a course of brick would prevent the floor from heating. This, however, is a mistake, for when once heated through the floor is just as hot with the pavement as without it. I demonstrated this to my entire satisfaction. We have a steam floor constructed as the one described and it gives better satisfaction than any other of the kind of which I have any knowledge.

The next question to determine is, Does it make back pressure on the engine? We find that by letting the steam escape freely from the discharging header pipe, the back pressure is hardly perceptible; if, however, we fail to do this the pressure against the engine becomes strong.

If the escape is sufficient the only pressure is, so far as I can see, the friction of the steam passing through the pipes—no more back pressure than in sending steam a hundred yards through a pipe, except that it passes through a series of small pipes, and the combined surface of this is much greater than one large pipe, hence more friction. This makes a good, permanent dry floor, and is especially adapted to drying repressed and ornamental bricks or drain tile.

Written for the Clay-Worker.

SEWER PIPES AND THEIR MANUFACTURE.

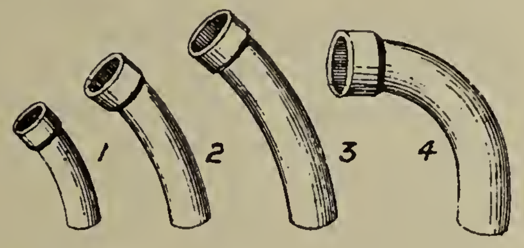
BY ALFRED CROSSLEY.

[CONTINUED.]

The thickness of the pipe and depth of the socket are matters in respect to which various rules have been proposed from time to time, and in which some makers have worked by no rule at all except the rule of thumb, producing very disproportionate results.

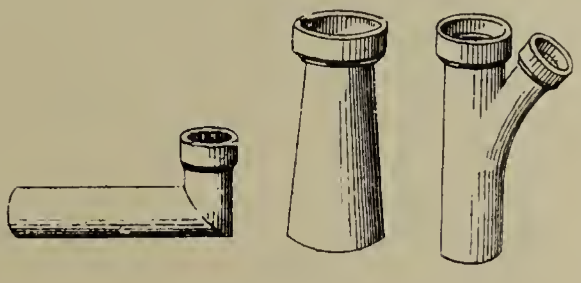
Probably the best rule in regard to thickness, is the one now generally adopted in England, as specified by the leading sanitary engineers, viz., for fire clay pipes one-tenth the diameter, and for stoneware pipes one-twelfth the diameter. This rule, applied to many of the pipes made in this country, would reduce the thickness of the smaller sizes, and increase the thickness of the larger sizes. Mr. Stephen E. Babcock, in a paper read before the American Water Works Association, at Cleveland, Ohio, stated that in his specification for vitrified stoneware pipe for an extensive water works system, he required the thickness to be one-twelfth the diameter, and remarking that this was heavier than the ordinary pipe. He also stated that for part of the work he used the ordinary depth of socket, 2¼ inches, but for other parts he required the depth of socket to be 3 inches. One very good rule proposed, as to the depth of socket, is for any size up to 10″ in diameter 2″ deep, and all above that size one-fifth the diameter. These are important matters that should not be left to the whim of each individual manufacturer, but should be decided by a representative body of sanitary engineers, so that some uniformity might be secured.

The connections and fittings used in sewer construction are somewhat varied, and consist of traps, branches, bends, elbows, and others. There is a considerable difference between the American and English nomenclature of these fittings, and as I think from an impartial criticism the American names are largely inappropriate and somewhat misleading I present below the illustrations of the fittings in most general use, with the English and American names appended, so that my readers can judge for themselves which are the most appropriate and convey to the mind the most correct idea of each article. The names I have given are those in most common use in each country.



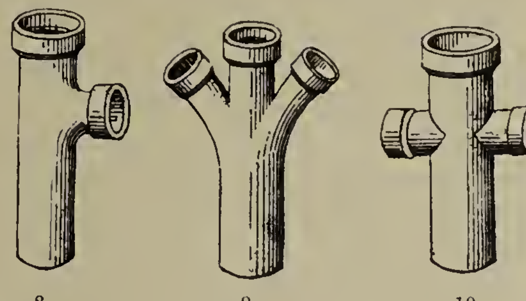
English Name.—1. Bend. 2. Bend. 3. Bend. 4. Bend.
American Name.—1. Curve. 2. Curve. 3. Curve. 4. Elbow.

I may say that although four bends are shown above, it is usual to make but two, known respectively as eighth and quarter bends, representing the number of each that would be required to describe a circle. The curve, as usually made in America, is full pipe length, whereas in England it is only half pipe length. The elbow is also in England made with the joint at an obtuse angle, and is then called a bent elbow. The taper pipe as shown above is the only style made in England, that is to enlarge the capacity of a sewer at one or more points to accommodate the increased flow from laterals or side drains. In America the reverse fitting is also made, and hence necessitates the use of the distinguishing terms, "increaser" and "diminisher." The latter was surely never made to the order of any sanitary engineer, for it must be contrary to common sense to ever diminish the capacity of a drain or sewer. With regard to junctions or branches, it can easily be seen that the American terms of Y and T branches are an evident misnomer, and should be discarded for something better. A great deal of absurdity exists in the matter of junctions and branches both in England and America. Take for instance a 12″ pipe, it seems contrary to common sense to bring into it a 12″ branch, but the height of folly is reached when a second branch of the same size is brought into it, making a double 12x12 branch, that is, three streams converged into one of the same size. For if it be really necessary to have a 12″ pipe from each of three directions to accommodate the flow, how can one of the same size carry the combined flow. This is another matter also that I think should be under the control of some well-defined scientific rules. Again there is the matter of the square branch, both single and double, which is contrary to all right principles. As a matter of fact many sanitary engineers condemn this, and require all side drains to be brought in at an acute angle.



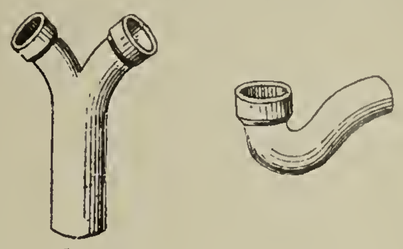
5. 6. 7.

English Name.—5. Elbow. 6. Taper pipe. 7. Slant Junction, single.
American Name.—5. Square Elbow. 6. Increaser. 7. Y Branch, single.



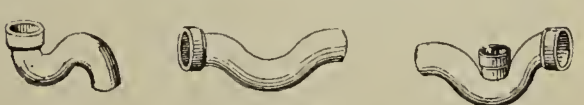
8. 9. 10.

English Name.—8. Square Junction, single. 9. Slant Junction, double. 10. Square Junction, double.
American Name.—8. T Branch, single. 9. Y Branch, double. 10. T Branch, double.



11. 12.

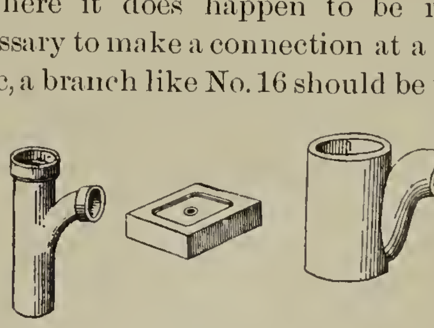
English Name.—11. Y Junction. 12. P Trap.
American Name.—11. Breeches. 12. P Trap.



13. 14. 15.

English Name.—13. S Trap. 14. Syphon Trap. 15. Syphon with Inlet.
American Name.—13. S Trap. 14. Running Trap. Hand-hole Trap.

Where it does happen to be really necessary to make a connection at a right angle, a branch like No. 16 should be used, called in England a "curve junction." This form should in fact entirely supersede the square branch, but so long as the engineers and consumers do not insist on it, the manufacturers will still go on making the old square branch. In the one case a short neck of socketed pipe stuck on to the main, is only need-



16. 17. 18.

ed, whereas in the other a proper bend has to be moulded and stuck on, and is consequently more costly to make. The maker should be recompensed for the extra cost and the square branch prohibited altogether. One of the most useful and general fittings to drains in England is the gully trap and grate for yards. I believe I am correct in saying, that so useful has this been found that it is regarded as a necessity, and that no house is allowed to be occupied in any English town until one of these has been provided in the yard connected with the house. I may here remark also in parenthesis, that the owner or builder of all new houses in an English town is compelled by law to make proper drainage connections from each house to the street sewer, and these drainage connections are not allowed to be covered up until they have been inspected and approved by the Borough Surveyor (same as our City Engineer) or his deputy. America is a smart and progressive country, but she may learn a few lessons yet from her old slow coach of a mother. The accompanying cut (17) shows one of the gullies with grate detached. The usual size is 9″ diameter, 18″ deep, and 4″ branch, with dished grate 18″ square set on top, to the rim of which the yard is paved so that all waste surface water runs into it. Other forms and sizes are also in use, but this is the most common. This affords a direct connection with the drain, while from its form all sewer gas or smell is effectually trapped, and also all solid matter or other foreign articles are kept out of the drain proper, and deposited in the bottom of the gully, from whence they are easily removed at intervals as required. This forms a most convenient method for disposal of slops and dirty water, instead of either pouring down the kitchen sink or throwing out into the street, as is too commonly the case in the average American town. Beside that, in time of heavy rainstorms, the surface water is quickly run off, instead of standing about in pools till either absorbed or evaporated, to the discomfort of the householders. When we reflect that the greater heat of our climate here renders the exhalations from dirty water thrown out on the open ground more noxious even here than in England, it will be seen that the improved method of disposal of such is an even greater necessity as a means of preserving health. I have been much surprised that the gully trap for yards has never been adopted here, and hence I think no apology is necessary in trying to bring the matter before the notice of our intelligent readers. I need hardly say to the manufacturers, that it is to their interest to push their introduction, for if once generally adopted, the consumption would be very large and a source of great profit to the makers.

In connection with the difference in names for the same articles by English and American makers, I would say that in one instance, viz., the Garnkirk Fire Clay Co., of Glasgow, Scotland, they have names somewhat similar to the American, although differing in many respects from both the styles named. It is interesting also to notice that this firm in the general name of the pipes as a whole come pretty near to the name in use here, viz., glazed sewerage pipes. In the old country, as a rule, they are called sanitary pipes, and in fact the exception noted above is the only one I know of. With regard to the comparative merits of the two names, "sanitary pipes" and "sewer pipes," either one of them is appropriate, presenting as they do a connection of ideas between the pipe itself and the principles that have brought it into existence, but I must confess that my preference is decidedly in favor of the American name "sewer pipe," as being the most distinctly appropriate, and the least ambiguous. I am the more free to say this after my previous criticisms of other names mentioned.

Written for the Clay-Worker.

BRICK FOR STREET PAVING.

The very general interest manifested in the use of brick for street paving induced us to make a visit to the cities of Bloomington and Decatur, Ill., to see the result of several years use of this pavement.

In the year 1876 while at Bloomington attending to some business of a personal character we witnessed the laying of one square (in length) of brick paving, which was laid on the west side of the Court House square, this street being one of the principal traveled streets in the city.

The method of the construction we remember quite well—not differing materially from the present approved method. The brick were furnished and laid by Mr. N. B. Heafer, a well known brick manufacturer of that city.

On arriving at the city of Bloomington our first point of interest was to examine the pavement laid in 1876, which we found to be in good condition after thirteen years use. All the repairs that have been made in this time have been those necessitated by the laying of water and gas connection which always leaves uneven surface, after the work is done and the fillings settle. Otherwise the pavement is apparently good for as many more years wear. The brick used in the laying of this pavement were selected from ordinary building brick, the hardest brick being used for this purpose, and were not equal in hardness to those required at present.

We visited the brick yards of Edgar M. Heafer (a son of N. B. Heafer) from whom we learned that the brick being used for street paving in the city of Bloomington at this time are made from a good quality of yellow clay and burned in the ordinary updraft kilns. The burns are as hard as the character of the clay will allow. The hardest brick are selected for top pavers, and any well burned brick will do for the bottom course of pavers. The remaining brick of each kiln are used for building purposes.

The advantage of using the common sizes of brick is apparent. If some of the brick are not suited for paving they may be used for other purposes occasioning no particular loss. The difference in price being a small matter.

The city of Bloomington, after fully testing the use of brick, has abandoned the use of all other kinds of material for paving. The street leading directly from the railroad station building to the central portion of the city was paved probably fifteen years ago with limestone but has worn into holes and is now being paved with brick. Also Grove Street, another of the principal streets, was macadamized a few years ago at considerable expense but has also worn into holes and is now being paved with brick.

Altogether the city has paved over six miles of her principal streets with brick pavers.

We conversed with a number of business men and it is the general verdict without an exception, that it is the best pavement that has so far been introduced for their use, and they have tried wooden blocks, stone, macadam and asphaltum.

The average cost of the pavement is estimated at $1.50 per square yard which includes grading, curbing, etc.

The streets paved with brick are smooth, clean, and in every respect desirable travel-ways, and they give to the city a substantial appearance.

We next visited Decatur which is one of the live cities of Central Illinois and has some beautiful suburban additions. Here they began to use brick for street paving six years ago, and the result has been so satisfactory that they now have over eight miles of streets paved with brick.

THE METHOD OF LAYING THE PAVEMENT

at this place is as follows: The street is brought to the grade required, which is but little crowning—probably four inches on a street fifty feet in width. The street is then rolled with a six ton cast rollers. Then a layer of sand is spread four inches thick on which a layer of good common hard brick are laid flat but lengthwise with the street and tamped down solidly with a heavy tamp, leaving an even surface. A two-inch layer of sand is then spread, care being taken to fill the interstices of the flat layer of brick, after which a course of what are called in this market "black hards" are set on edge crosswise of the street, breaking joints same as in building; these are tamped down solidly, leaving the surface as even as possible. Over the surface a layer of sand is spread of sufficient thickness to fill all the spaces left in laying by the common travel of the street, and the surface is again rolled several times with the cast roller. Both layers of brick are set as close as possible by hand so as to leave the smallest spaces only.

THE BRICK

used for the top course are very hard indeed. We examined those manufactured by the Decatur Tile & Brick Co., of Decatur. They are made from common yellow clay. The clay is carted directly from bank to pit where it is wet and allowed to soak one day, then it is carried by elevator to crushers, and then pressed by a McKenzie machine. There are three streams of clay issuing from the dies, the brick are end cut, then dried and burned in down-draft kilns until they are vitrified.

In using the word "vitrified" in this case, we mean it. A brick that is not vitrified through as solidly as it is possible to make them when taken from the kilns is the exception. As an evidence of their character it is sufficient to say that in delivering on the streets the brick are pitched from the wagon by hand into piles, the same as bowlders are handled, and there is seldom a broken brick. The brick have a bright black glaze, the result of vitrification and not from any other cause.

In an interview with Mr. J. G. Shea and Mr. Stafford who have charge of the works we learned that they use six ordinary round down draft kilns, each kiln holding 38,000 brick, besides, they have three large square or rather oblong crowned kilns, that hold about 100,000 each, one of which is a Eudaly kiln.

The proprietors claim that the advantages from burning in crowned kilns are that they can better control the heat, increasing the temperature to the highest point that the brick will stand and not run together and then hold them at this degree of heat until well done, then cool slowly, which serves to toughen the fibre of the brick. Four specimen brick made by this company picked up at random were submitted to a test by the Chicago Forge & Belt Co., the crushing resistance was found to be 250,000, 228,000, 210,000 and 318,000 pounds respectively. The brick measured 7¼x2¼x4 inches.

Mr. Shea informs us that numerous samples of clay have been sent him to burn, to test their quality for street paving, and that he has succeeded in making good pavers of all with but one exception. He further says that any good common clay may be so tempered, made into brick, and burned, as to make good pavers; that the clay that is used by the Decatur Tile Company is only a common clay and difficult to manufacture into either brick or tile. That some clays are much better than others admits of no doubt, but the idea that the clay adapted to the manufacture of pavers is the exception should be combated. Clays adapted to this use can be found in great abundance.

We conversed with several property owners who have had to bear the expense of the improvement of their streets and in no instance did they complain of the expense in view of the advantages gained.

HOW LONG WILL IT LAST PROBABLY?

And the reply almost uniformly would be, "It looks like it might last twenty-five or thirty years." The more enthusiastic would reply, "Fifty years with a little repair occasionally." The street paved six years ago is traveled more probably than any other in the city and yet it has not cost a penny for repairs. And still it is admitted that the character of the material used now in the construction of the pavements is much better, that is, harder and more tenacious.

THE REPAIRING.

After twenty years of wear if it is necessary to repair, the expense will be small compared with other pavements.

The grade of the street and the foundation layer of brick will be in tact and many of the top brick will be good so that a renewal of the pavement after twenty or twenty-five years of wear will not be expensive.

THE CONTRACT PRICE.

The pavements that are being laid at this time costs as follows: $1.32,$1.37 and $1.40 per square yard, which includes grading and curbing complete. The difference in price depending upon the grading.

Written for the Clay-Worker.

CONVENTION BRICKDUST.

No. 4.

Brother Members we are called upon by our honorable executive committee to congregate our aggregated wisdom in Philadelphia, Penn., on the 10th, 11th and 12th of December, 1889, and I trust every progressive brickmaker in the land will be there. All are cordially invited without regard to race, color or previous condition of knowitalliveness. If any are afflicted with the last named complaint and will attend the coming session of the N. B. M. A., they will be discharged either as cured or hopelessly incurable.

Brethren of the craft, from whatever section of this great country you may come from, you will feel amply repaid for your time and outlay of money, first, because no brickmaker has ever attended one of our annual sessions in good faith without realizing that it pays. Again you will have an opportunity to see one of the finest cities on this continent or any other. This is true for several reasons. If any of you will mount the tower in Fairmount Park, or any of the towers of the city you will behold a panorama that will make you proud of your profession. You will see between the Delaware and Schuylkill rivers, and west of the latter, as far as the eye can see, blocks, acres and square miles of beautiful red pressed brick walls, dotted here and there with some majestic pile of stone or iron. Towering head and shoulders above all competitors is the new City Hall, probably the finest structure in the new world, with its tower four hundred feet high and still moving heavenward—slowly but surely it has been rising for twenty years, and I sincerely hope that its mighty foundations may not be disturbed, by the after dinner eloquence of our honored ex-presidents, or that of the "brickmaker to the president," to say nothing of the *petrified* eloquence of my esteemed friend, formerly of Philadelphia, more recently of Denver, Colorado. Again, there is Independence Hall, where the immortal Declaration of Independence was signed, and the historic bell that peeled forth the glad tidings—here you can see the birth place of the greatest nation the sun shines on. And about five hundred of the best looking and most enterprising brickmakers this great nation has produced. And last but not least, you will be cordially welcomed and delightfully entertained by the Philadelphia brickmakers, with many of whom the writer is personally acquainted.

They can give us some valuable points on brickmaking, especially the manufacture of pressed and ornamental bricks, and we of course will drop a few chunks of brickbat wisdom among them that may bring forth fruit.

Let us all be there, and those of us who travel on a crosstie ticket must start in good time, and help pass that "chestnut" resolution about limiting members to five minute speeches, and only one speech on each subject, unless the speaker chooses to speak longer or oftener.

Before this little cloud of "dust" settles among the old iron and brickbats I must say a word about poor Gates of Terra Cotta. While our hungry looking brother had his faults, he was a pretty good sort of an individual, and if in my troubles and trials and loss of valuable head gear at Memphis I said anything that I am sorry for, I am glad of it. While I felt that retribution (of heaven) would overtake Bro. Gates, I did not hope or expect fatal consequences. I hope he is better off, poor fellow; that is, I trust he will have a new hat this winter, of *his own.* I also hope this apology will be satisfactory to Mr. "Fair Play," who so cleverly defended Bro. "G." May he have to burn bricks with sawdust and putty without a patent kiln.

Bro. "Fair Play," if you step up and acknowledge the error of your youthful ways I will give you the right hand of fellowship, and put a spoonful of brickdust in your ear, and you will go home thinking you are the greatest brickmaker on the earth.

Again I say to every brickmaker, come, and bring your partner and your superintendent, and your cousins, and your wife's people, and although I have grown gray in the service and am threatened with baldness (now don't think of that venerable "chestnut" about a "brick in my hat") and may be mistaken for an envelope needing a stamp, at the play, I am and always will be, your friend.

A—C—MEMBER.

Written for the Clay Worker.

SOME FINE EXAMPLES OF TERRA COTTA.

The visitor making the rounds of our national capital and on the lookout for specimens of architectural display in the line of bricks and terra cotta, will be very highly gratified. The writer was in Washington some months past—not there for an office or position in the Government employ, nor any lobbying scheme, but went with his eyes and ears open to see and learn all he could of bricks and those who make them.

It is quite the thing to do, to visit our Governmental buildings,monuments,etc., and the National Museum of course is one place that has many attractions.

The Pension Department Building is a fine building built of brick, stone, and terra cotta. The terra cotta belt course which extends entirely around the building, above the first story, is a piece of work that will strike the attention of most persons very forcibly, and more particularly those who were participants in the march and encounter this panel is designed to commemorate.

The design represents the different arms of the service, marching in files in one direction. Infantry, cavalry, artillery and the navy are each represented, with a rear guard of footsore, wounded, sick and otherwise disabled veterans, hobbling along together with the wagon train and ambulance corps.

Few indeed are the old soldiers who can look at the figures represented in this piece of work and not be stirred by a tide of memories, that dates back to the times when we "marched and fit" from '61 to '65.

On entering the National Museum the first, or almost the first object that arrests the eye of the observer is a pulpit of terra cotta. It stands just inside and to the left of the door as one enters the building. The top of the desk, the treads of the steps, and rail is of black walnut. The balance of the pulpit entire is of clay ware. Part of the columns and the raised flower work ornamenting the side of stair and railing is done in blue glaze. The whole piece is highly ornate, and is well illustrated in scriptural designs, representing the preaching of the word.

The piece of work is from the works of H. Doulton & Co., Lambeth, England, and designed by Geo. Tinsworth. Another piece of terra cotta ware designed and executed by the same parties is a baptismal fount of exquisite workmanship and design.

The fount stands about four feet in heighth. The basin proper being about three feet in diameter, octagon in shape, supported at the angles by beautiful columns, which are supported by the base or pedestal of the fount. The basin is enameled in blue glaze, also the ornamentation of the columns, and raised flower work of the capitals and frieze above. Four doves are seated on the rim of the basin facing inwards. The columns below are supplemented with another row of shorter columns, above and between them are ornate panels of scriptural designs representing child life as taken from sacred history.

There are in all eight of these. To the reader familiar with bible history it is an easy task to recall to mind the story of Jairus' daughter, Christ blessing the children, the call of Samuel, the sacrifice of Isaac, and others. These are very faithfully portrayed in the work. The beauty of this piece of work can hardly be surpassed in wood or metal, and it is made of a material so little used for such purpose that it commands our admiration.

This work was exhibited at Philadelphia in 1876 at the Centennial Exhibition, and later was presented to the National Museum and is No. 75,383 on the list.

We regret very much our inability at the time to secure an engraving or photograph fo these works of art, from which engravings, might have been made and shown, much better than a mere description, which fails to convey to the general reader the real meaning or true value of the design.

BRIX.

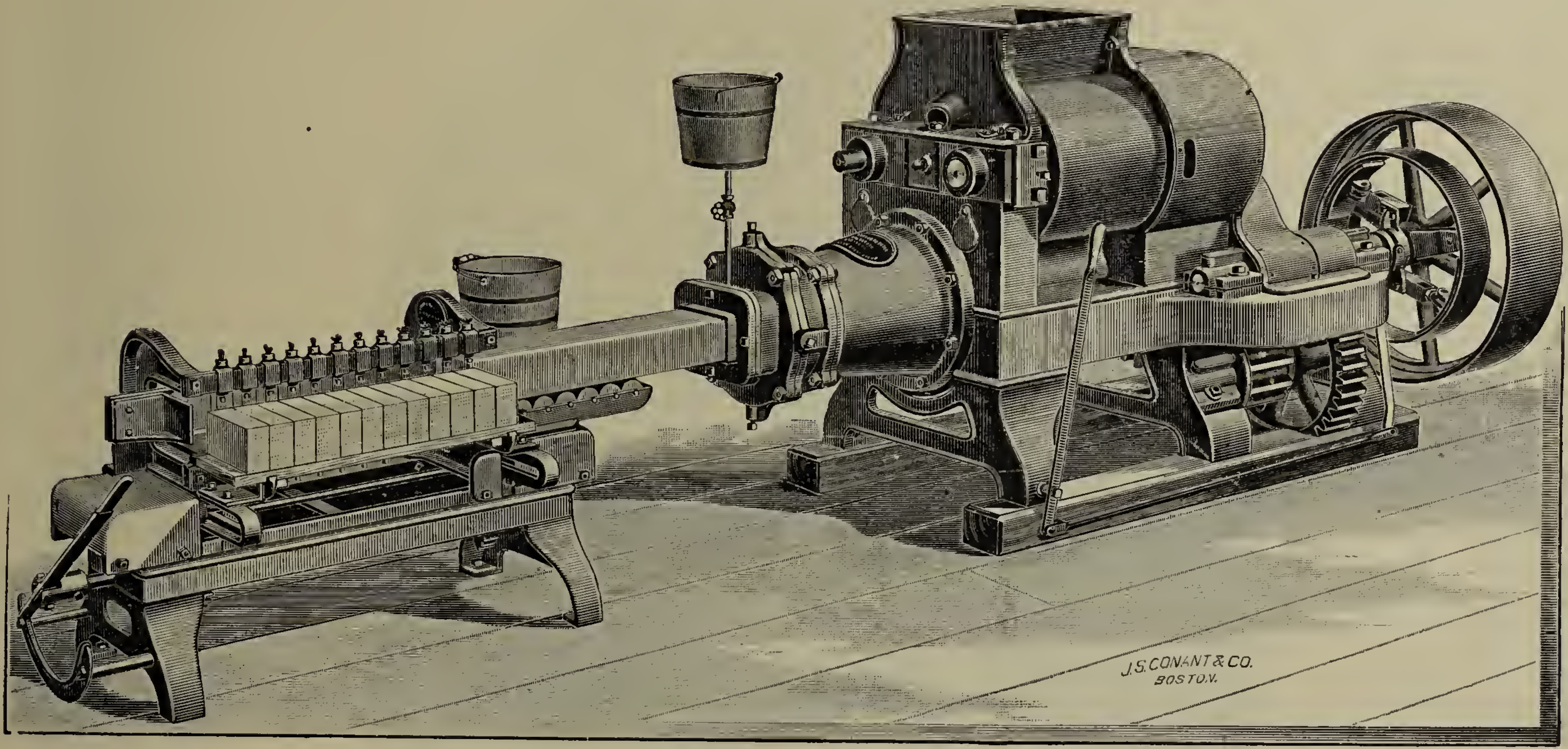
"OUT OF SIGHT---OUT OF MIND."

Postmaster General John Wannamaker, Philadelphia's great merchant, is regarded as the best all around advertiser in this country. He understands the art—and he knows how to forcibly express himself about advertising.

Recently Mr. Wannamaker said: "To discontinue an advertisement is like taking down your sign. If you want to do business you must let the public know it. Standing advertisements,when changed frequently, are better and cheaper than reading notices. They look more substantial and business like and inspire confidence. I would as soon think of doing business without clerks as without advertising regularly.—*Sunday Times.*

RELIABLE BRICK MACHINERY.

The illustration to which we invite your attention represents the largest size or "A" Ohio Brick and Tile Machine, manufactured by Fate and Freese, of Plymouth, Ohio. Its massive proportions and unequalled strength, as well as its simplicity and the evident special adaptation of all its parts to the purpose for which they were intended, cannot fail to interest brickmakers in general, and especially that large and unfortunate class who have experienced the vexations and losses incident to the use of weak and inefficient machinery.



"A" Ohio Brick and Tile Machine with Board Delivery Cutting Table.

This firm, whose specialty is clay working machinery, manufactures three sizes of these machines, having a capacity of from 10,000 to 40,000 brick per day and other ware in proportion, thus meeting the wants of all customers. Their machinery is designed by Mr. E. M. Freese, who has charge of the manufacturing department, and whose determination since engaging in this business has always been to give the users of clay-working machinery something much better than could be had elsewhere. He has, during the present year, completed the A and B sizes of the Ohio Brick and Tile Machines, in which he has embodied new and important improvements not found in others. These have been developed by careful observation of the variety of material and men to which this class of machinery should be adapted and by persistent study to originate plans, and proper tests to prove their practical value.

The leading features which have been secured in these machines are—certainty of producing the best and most perfect ware. Absence of all parts which would require special skill or care in their management, and the greatest freedom of every part from liability of breakage or serious wear.

The material of which these machines are constructed is strictly first-class, steel being largely employed. Their high degree of mechanical exactness admits of the perfect duplication of any part.

The new lubricating die, shown in cut, invented by Mr. Freese, is said to have no equal for its purpose, both as regards the form and the texture of the brick produced by it. Many of them have been in use during the past season in a great variety of clays with most satisfactory results. It is not lined with sheet metal, but is more substantial and durable.

His most recent production is the Brick Cutting Table here shown.

Readers of the Clay-Worker will remember reference being made some time since, by an English correspondent, to the Board Delivery Cutting Table which had come into general use in that country.

The Freese Table has all the desirable features of the English table and in addition, has important advantages. The principle upon which the brick are cut by the English form of table necessitates two waste ends or imperfect pieces at each cut, which amounts to a loss of from 10 to 20 per cent. of the entire output of the machine and at the same time it is laborious and troublesome in operation.

With the Table here shown there is no waste whatever. It is operated entirely by one lever, one stroke of which cuts off twelve brick and at the same carries the delivery board or pallet under the cut brick. The return of the lever carries out the loaded pallet and returns the Table to its place ready to again receive the continually advancing column of clay. The operator does not touch the clay either before or after the cut is made. Its work is rapid and it leaves the brick in a perfect condition. It can be used with any auger machine and no one making brick by this process can afford to be without it.

The manufacturers take pleasure in answering all inquiries concerning their machinery and desire to send their descriptive Catalogue to all interested.

Address FATE & FREESE,
Plymouth, Ohio.

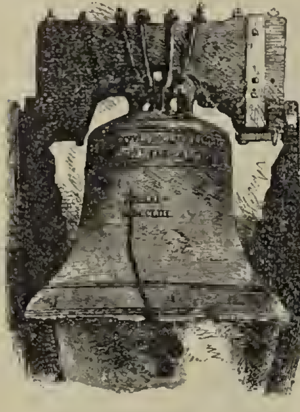
OUR WEATHER OBSERVATIONS.

Weather fair, very fair. Sunshine in our office—witness our growth in this number—and it is a normal, healthy growth. Orders for advertisements are not crowding upon us by telegraph, but they get here.

Indications for the future: Weather fine, very fine in the "Hoosier Capital:" A little windy in Chicago; local, however, and not serious.

PHILADELPHIA SKETCHES.

THE ANNUAL MEETING.



LIBERYT BELL.

The National Brick Manufacturers' Association will meet in annual convention at Philadelphia, on the 10th of December next, and will continue in session on the 11th and 12th. We anticipate a large and interesting convention (1) because it furnishes the best opportunity to every one interested in the manufacture of brick to become acquainted with the improvements in that art which have been made within the past year. Important as the press is, and its importance can hardly be exaggerated, yet there are many improvements in the details of the business that will never appear in print. These can be gathered only in the personal intercourse of the workers. These may each be small in themselves, but in the aggregate we can hardly overestimate them. (2) The social element of this organization commends it to every brickmaker in the nation, and no one thus engaged can afford to forego the advantages it offers. (3) The session for the present year will be held in the historic city of Philadelphia and will afford an opportunity to examine some of the most interesting mementoes of our early national history. Here stands the first Temple of American Liberty.

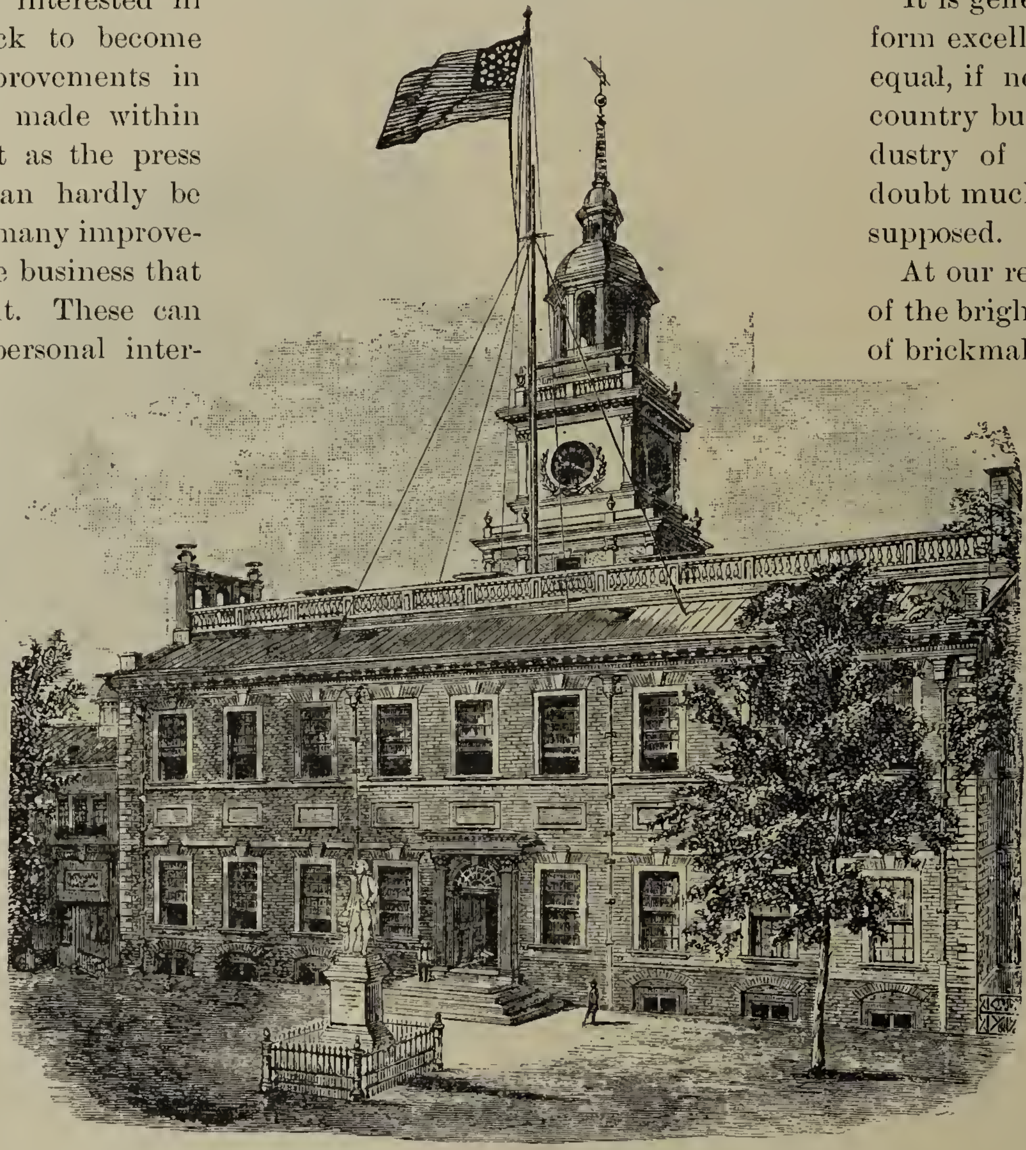
INDEPENDENCE HALL.

Like a number of other buildings in that city, it was built with imported brick and its excellent state of preservation testifies the durability of brick as a building material in no uncertain terms. To those who have never visited the city of "Brotherly Love," and in the West there are many such men, it will be a memorable event to stand in the hall where the sages of this nation pledged to each other and to the colonies, "their lives, their fortunes and their sacred honor to maintain the independence of the new born Nation." Here was proclaimed the fundamental principles of human governments—truths that burst on the nations of Europe like a thunder peal from a clear sky and shook the thrones of the old world. Go, stand in that hall and renew your patriotism!

Philadelphia has been the home of many notable men who achieved great distinction and honor. Among the greatest of this nation's statesmen whose memories we revere for their patriotism and philanthropy, the name of

BENJAMIN FRANKLIN

stands foremost and there rests his mortal remains. The portrait of his masterly face which looks up from the opposite page was taken from a terra-cotta tablet made by the Boston Terra Cotta Co., to whom we are indebted for the plate.



INDEPENDENCE HALL.

Dr. Franklin was, at least as far as this country is concerned, the father of the Utilitarian philosophy. His life was devoted to the study of the Useful. Even his discovery of the identity of lightning and electricity, which was the initial step in the control of atmospheric electricity, was made with a view of securing life and property from destruction by this mysterious power. The final success of the revolutionary struggle depended more on the sagacity and practical wisdom of Dr. Franklin as Minister Plenipotentiary at the court of France than has ever been credited to him. Philadelphia was his home; here he performed that wonderful feat of self-education that made him the true type of American character. To walk the streets that Franklin walked, and to look at the same scenes that he admired, is worth a pilgrimage to Philadelphia. Go to the Convention and you will return a wiser, more patriotic and a happier man.

PHILADELPHIA BRICK MARKET.

It is generally conceded that for uniform excellence, Philadelphia brick are equal, if not superior to any in this country but the extent of the brick industry of that commonwealth is no doubt much greater than is commonly supposed.

At our request, Mr. F. B. McAvoy, one of the brightest of the younger generation of brickmakers of that city has compiled the following estimates, which are thought to be nearly exact and correct. Mr McAvoy is a native of Philadelphia and is, therefore, perfectly familiar with the subject.

The past season has been an unfavorable one owing to frequent and heavy rains, the older manufacturers claim that it is the worst season they have had in 20 years, so the season of 1888 has been made the basis of the calculation.

A SEASON'S WORK.

Number of hand gangs, each containing 2 men and 1 boy, 560; each gang make on an average, during a season, 350,000 making a total of 196,000,000 brick made by hand.

Number of machines in use also name was viz.: Chambers, 13; Martin, 12; Peerless, 2; Excelsior, 2; Tiffany, 1; Tallcot, 1. Total 31, which made 154,000,000 brick.

GRAND TOTAL.

Hand and machine brick . . .	350,000,000
Value of product	$ 3,500,000
Capital invested	$ 3,000.000
Number of employes	4,000

The repress or pressed brick, was 35,000,000 or 10 per cent. of the total product. The ornamental and enamelled, 2,000,000.

There are employed to repress these bricks, independent of the gangs who make them, about 140 gangs, consisting of 1 man and 2 boys.

There is at least 100,000,000 brick made within a few miles of the country line that are nearly all brought to the Phila-market.

There is also in Philadelphia, 13 fire brick works, employing 300 men and produce goods to the value of $636,000.

MASTER BUILDERS' EXCHANGE Of Philadelphia.

This prosperous association is now occupying its new building on Seventh St. between Chestnut and Walnut Streets, which has been reconstructed during the past year and especially adapted to the needs and purposes of the Exchange.

From basement to roof the entire building, which has a frontage of 75 feet on Seventh Street and extends back 100 feet, is devoted to the use of the Exchange and its members. In the basement the Master Builders' Mechanical Trade Schools will be located, where a course of instruction will be given in Carpentry, Bricklaying, Plastering, Stone Cutting, Plumbing, Painting, etc., etc.

The first floor is entirely given up to a permanent exhibit of building materials. This department will be open to the public and no doubt prove an attractive feature.

On the second floor front is the general meeting room of the Exchange, 75x40 feet, together with committee rooms, toilet rooms, etc. The balance of this floor and the four floors above, which, with a series of galleries surround an open court, contains numerous well lighted offices for members, architects and others identified with the building interests.

It is a fitting and elegant home for the Exchange and its members and will doubtless be taken as a model by exchanges of other cities when building for themselves.

By courtesy of the directors of the Exchange the use of their rooms are extended to all who attend the convention of the National Brick Manufacturers' Association, who are cordially invited to make the Exchange headquarters during their stay in the city of "Brotherly Llove."

Those who wish can have their mail addressed to them in care of the *Master Builders' Exchange* and may feel assured that it will be carefully looked after by the genial secretary, Mr. William Harkness, and his able assistant, who, seemingly, find pleasure in attending to the wants of fellow craftsmen. Certainly they spare no pains or trouble to make all who patronize the Exchange perfectly comfortable and happy.

Directly opposite or across the street from the Exchange Building is

THE CONVENTION HALL,

where the coming meeting of the National Brick Manufacturers' Association will be held in the Lecture Room of

FRANKLIN INSTITUTE

of which our readers may be pleased to know something.

Benjamin Franklin.

The Franklin Institute, of the State of Pennsylvania, was founded in the year 1824, for the purpose of promoting the mechanic arts, and is among the oldest and best known educational institutions of that State. The first exhibition of American Manufactures held in the United States was made under its direction in that year. The institute now has a Library containing over 32,000 volumes and 18,000 pamphlets which are exclusively scientific and technical in character.

A special feature of the Institute is a school of instruction in drawing, embracing the mechanical, architectural and freehand branches, which has been maintained uninterruptedly since 1824. Two years later the *Journal of the Franklin Institute* was first published. It is a monthly devoted to science and the mechanic arts and has been issued regularly ever since, till now it is considered a standard work of reference. It is in the lecture room or hall of this honored Institute, where so many learned men and ambitious scholars have met together for counsel and mutual benefit, that the fourth annual convention of brickmakers will be held in December next. It is to be hoped that the spirit of the meeting will be in keeping with the place.

HISTORICAL NOTES.

As many of our readers will visit Philadelphia next month in attendance on the annual session of National Brick Manufacturers' Association, they will probably be interested in a few historical notes of that city.

Philadelphia belongs to a grant of land made to William Penn by Charles II in 1680. The first settlement was made by a colony, chiefly Friends, in 1681. The name "Phiadelphia" (meaning brotherly love) was selected by Penn himself. His purchase of the land from the Indians after having received a grant from the British crown is a fact characteristic of the man.

The State House, now known as Independence Hall was begun in 1732 and completed in 1735. In this building the Colonial Congress held its sessions, and here on the 4th of July, 1776, they signed the Declaration which made the thirteen colonies an independent nation.

For many years Philadelphia was the chief commercial city of America, and after New York had secured this distinction, it still held its position as the monetary centre of the nation till the expiration of the charter of the United States bank in 1832. It was the seat of the American Congress till 1800. In 1876 the great Centennial exhibition was held in West Philadelphia from May till October.

OFFICIAL ANNOUNCEMENT AND PROGRAMME

Of the Fourth Annual Convention of the National Brick Manufacturers' Association.

To the Members of the N. B. M. Ass'n.

GENTLEMEN:—

As announced in the official report of the proceedings of our last annual convention, the next yearly meeting will be held in Philadelphia, Pa., Tuesday, Wednesday and Thursday, December 10th, 11th and 12th, 1889.

PLACE OF MEETING.

The Convention will meet in Franklin Institute Hall on Seventh Street, between Chestnut and Market Streets. The following is the

PROGRAMME.

FIRST SESSION, TUESDAY, 2:30 P.M.

Roll Call.
Reports of Officers.
Enrollment of New Members.
President's Annual Address—
Robt. A. Speed, Memphis, Tenn.
Election of Officers.
Paper, "Theory and Practice of Brickmaking"—
J. W. Crary, Sr., Bluff Springs, Fla.
Discussion of same.

NOTE: Each subject presented for consideration will be discussed by members of the Association when the speaker has finished.

TUESDAY EVENING, 8:00 P.M.

Second Annual Pow-wow under the auspices of the Philadelphia Brickmakers Protective Association, held in St. George's Hall, southwest corner Thirteenth and Arch Streets.

SECOND SESSION, WEDNESDAY, 9:30 A.M.

1. "Brickmaking in New England," address—
Geo. M. Fiske, Boston, Mass.
2. "Moulded and Ornamental Brick," essay—
James Taylor, Long Island City, N. Y.
3. "A Common Sense Talk on Brick and Brickmaking," address—John Cubbins, Memphis.
4. "Drying Brick," essay—
Edmund Webster, Philadelphia, Pa.
5. "Repressing Brick." discussion led by
J. A. Baggs, Bridgeport, Ohio.

THIRD SESSION, WEDNESDAY, 3:00 P.M.

6. "The Key to Success in Brickmaking,"
W. H. Brush, Buffalo, N. Y.
7. "Advantages and Disadvantages of Making Brick by Hand," address—
Jacob Dowler, Philadelphia, Pa.
8. "Some Lessons Learned in Thirty-five Years of Practical Brickmaking," address—
Hon. Geo. S. Oldfield, Norfolk, Va.
9. "The Stiff Clay Process," essay—
W. H. Alsip, Chicago, Ills.
10. Question Box.

FOURTH SESSION, THURSDAY, 9:00 A.M.

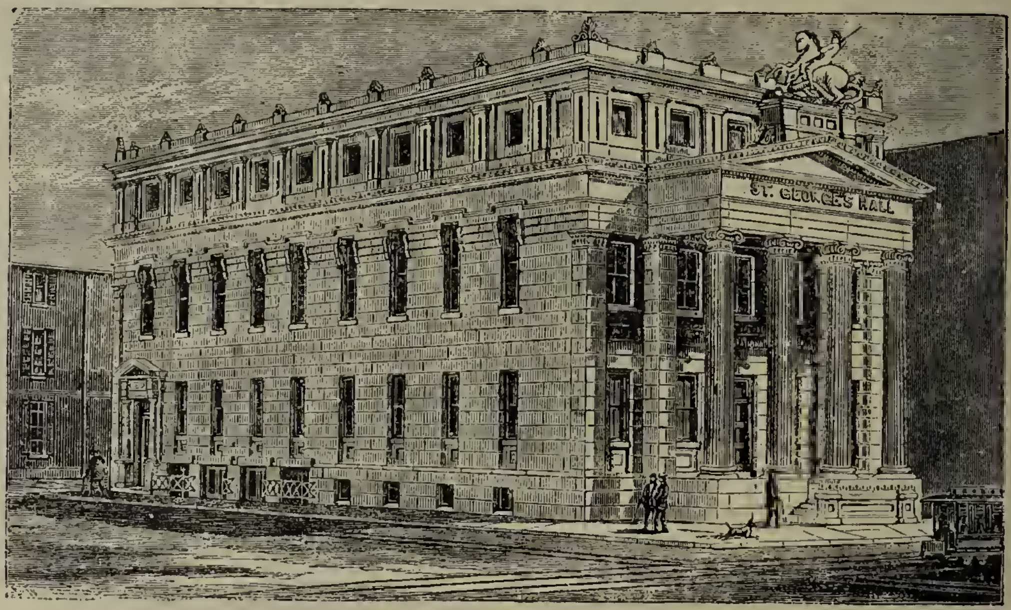
11. "Hints to the Inexperienced in Brickmaking" address— J. A. Reep, Knoxville, Tenn.
12. "Paving Brick, their Manufacture and Use," essay J. H. Calkins, Galesburgh, Ill.
13. "Burning Brick," address—
Thos. R. McAvoy, Philadelphia, Pa.
14. "The Dry Press Process," essay—
S. J. Rose & Son, Chester, Pa.
15. "Burning Dry Press Brick," discuss on
Led by————

16. Question Box.

FIFTH SESSION, THURSDAY, 3:00 P.M.

17. "Evolution of the Brick Machine," essay—
Geo. S. Tiffany, Tecumseh, Mich.
18. "Experiments in the Manufacture of Fuel for Burning Brick,"—
A. J. Baker Denver, Col.
19. Question Box.
Report of Committees.
Miscellaneous Business.
Adjournment.

It has been thought best to make up the programme entirely from members who have not heretofore addressed the Association in a formal manner in order that the current of thought and exprience may be broadened and deepened. While in this manner it is hoped to obtain "new blood," we are assured that those who have rendered such valiant service in former years will be with us and again lend their welcome voices and good cheer, joining earnestly in the discussions as of old.



ST. GEORGE'S HALL, COR. THIRTEENTH AND ARCH STREETS.

HOTEL ACCOMODATIONS.

Special arrangements have been made for the entertainment of members and visitors with the Continental Hotel, located on Chestnut Street, corner of Ninth, which, it will be remembered, was headquarters during the National Builder's Convention, also with the Girard House, which is just across the street from the Continental, and the Washington Hotel, on Chestnut Street between Seventh and Eighth. All of these are conveniently located within a few minutes' walk of the Franklin Institute in which the convention will be held. Directly opposite from the convention hall is the Philadelphia

MASTER BUILDERS' EXCHANGE,

which by courtesy of their Board of Directors, will be thrown open to members and visitors during the convention. All are cordially invited to make the Exchange headquarters during their stay in the city. Those desiring it, may have their mail sent to them in care of the Master Builders' Exchange.

REDUCED RAILROAD RATES

Have been obtained from all roads composing the Trunk Line Association, the Central Traffic Association and the Southern Passenger Association which include nearly if not all, the leading railways in the Eastern, Central, Southern and Western States. Over all these lines a two-thirds rate has been arranged for on the certificate plan as follows:

HOW TO SECURE REDUCED RATES.

1. Each person desiring the excursion rate must purchase a first-class ticket either limited or unlimited, to the place of meeting, for which he will pay the regular fare, and upon request, the Ticket Agent will issue a printed certificate of purchase.

2. If through tickets can not be procured at the starting point, parties will purchase to the most convenient point where suc through tickets can be obtained, and repurchase through to place of meeting, requesting a certificate from the Ticket Agent at the point where repurchase is made.

3. Tickets for the return journey will be sold by the Ticket Agents at the place of meeting at one-third the highest limited fare, only to those holding certificates signed by the Ticket Agent at point where through tickets to place of meeting was purchased, and countersigned by signature written in ink by the Corresponding Secretary of the Convention, certifying that the holder has been in regular attendance at the meeting.

4. It is very important that a certificate be procured, as it will indicate that full fare has been paid for the going journey and that the purchaser is, therefore, entitled to the excursion fare returning. It will also determine the route via which the ticket for return journey should be issued.

5. Tickets for return journey will be furnished only on certificates procured not more

than THREE DAYS before the meeting assembles and will be available for continuous trips only; no stop-over privileges being allowed on tickets sold at less than full fares. Certificates will not be honored unless presented within THREE DAYS after the adjourment of the meeting.

Should any station Agent fail to have a blank certificate a Receipt for the amount paid, stating that it is for one first-class fare and bearing the Agent's stamp should be taken and will enable the Secretary of the Association to obtain the reduced fare returning, and which cannot be done if no certificate or receipt is taken.

From all quarters—North, South, East and West—comes favorable and encouraging reports from our craftsmen who, without exception, express approval of both the time and place selected for our next annual meeting. There are unmistakable signs of increasing interest in the National Association and its work; many brickmakers who have not heretofore identified themselves with us are now joining the Association and will meet and participate with us in the work at Philadelphia. These indications of a constantly increasing interest on the part of individual craftsmen generally, is very gratifying for they bode a day of better things—a more rapid and general improvement in methods and products.

Anyone desiring further information as to the objects of our association with a view of becoming members will please address the Corresponding Secretary, Mr. Theo. A. Randall, Indianapolis, Ind., from whom also may be obtained copies of the report of the proceedings of the last convention.

All who are interested in brickmaking, whether directly or indirectly, are earnestly invited to join the Association, attend the coming convention and lend their influence and assistance in the effort to advance the craft to the high position it deserves among the great industrial interests of this Nation.

Respectfully,

THE EXECUTIVE COMMITTEE,

by R. A. SPEED, *Pres.*

T. A. RANDALL, *Cor. Sec'y.*

STRICTLY BUSINESS.

She was a maid of high degree,
  And quite severely proper.
Each man she met, so proud was she,
  Would love, despair, then drop her.

But there remained without demur,
  When all the rest forsook her,
An amateur photographer,
  An finally he took her.

—Life.

Written for the Clay-Worker.

TIMELY SUGGESTIONS.

Topics that Should be Discussed at the Brick Manufacturers Convention.

I am not a member of the N. B. M. A., but I am interested in the manufacture of brick and I would like to offer some suggestions for the consideration of the Association that ought to interest brickmakers everywhere.

It is not of improved methods of manfacture, but of improving the demand for brick to which I wish to call attention. We must do something to awaken the people to the importance of using only indestructible material in all buildings. Let each brickmaker look around him and see how many wooden houses are built to one of brick, and he will surely agree with me that something should be done toward educating the people up to a proper appreciation of the value of a brick. The thrifty mechanic who builds a modest house in the suburbs should use brick as well as his employer who builds a mansion. But it is in the country where we, the "village brickmakers," would like to see a revolution or the dawn of a new era in the manner of building. Not only should all residences be built of brick, but almost every other building on the farm. Barns and granaries could be built so as to be proof against cold and heat, and also practically fire-proof. Houses for the pigs and poultry, the ice-house and the carriage-house, should be built of brick. Then there are walks to be laid from the house to road, to the out houses and to the barn. There should be brick paving around barn doors, watering troughs and gateways for the comfort and welfare of the farm stock as well as their owner.

As the city brickmaker sees before him a widening market on account of the paving of streets, may not the village brickmaker in the not very distant future see a vision of brick paved country roads, creating a demand limited only by the ability of the people to buy?

We cannot increase the demand for brick by meeting in convention and exchanging ideas; this is all well enough so far as the making of brick by the best methods is concerned, but each brickmaker must work at home each in his own particular field by increasing the interest in the use of brick and by extending a knowledge of the benefits to be realized among the people.

Why would it not be a good plan for the N. B. M. A. to offer prizes for the best essays upon architecture in brick with numerous plans for all kinds of buildings for various purposes from the most inexpensive that can be built to the most costly?

These essays should treat not only of architecture but also of the best manner of building walls for strength and dryness; of the composition of mortars and cements; of fire proofing floors, wooden beams and roofs and also of the comparative cost, in the long run, of brick and wood.

These prize essays and all other information likely to be of benefit to the trade could be published by the associations and furnished to members in such quantities as each might need in his business.

Then there are other matters. Do we not need a new kind of martar? How soon the brick in a chimney become loosened and ready to tumble down? Cannot our inventors give us a mortar that will resist alternate heat and cold, wet and drought?

I think we have only entered the beginning of the age of brick. S. G.

Vermillion Co., Ill.

HOW TO BECOME A CAPITALIST.

Somebody, writes Washington Gladden, in the September *Forum*, must save money, and the people who save it will be the capitalists, and they will control the organization of industry and receive the larger share of the profits. If the workingmen will save their money they may not only be sharers of profits, but owners of stocks and receivers of dividends. And the working men can save their money if they will. It is the only way in which they can permanently and surely improve their condition. Legislative reforms, improved industrial methods, may make the way easier for them, but there is no road to comfort and independence, after all, but the plain old path of steady work and sober saving. If the working people of this country would save, for the next five years the money that they spend on beer and tobacco and base ball, they could control a pretty large share of the capital employed in the industries by which they get their living, and could turn the dividends of this capital from the pockets of the money lenders into their own. There is no other way of checking the congestion of wealth and of promoting its diffusion so expeditious, so certain and so beneficial as this. I wish the working people would try it.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN BY CORRESPONDENT. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Burning Brick.

Editor Clay-Worker:

I notice in the October number of the Clay-Worker, page 241, a communication from A. J. Kautz, Jr., Newport, Pa., asking for advice. First, I would advise that the brick be set on the plan illustrated in a recent number of the Clay-Worker, at least set the middle bench of the arch all loose, and each third course stretchers. Mr. K. says, "When we first set fire we dare not get through in less than thirty hours." I am not certain whether he means through the top of the kiln or meeting fires in the arch. Thirty hours is quick time to get the fire through to the top. My advice is to dry off the kiln slowly with wood or coke, then put on coal and fire moderately until the fire shows up all over the top, then put on the settling heat and make the required amount of settle in from 60 to 72 hours, put on straight hard brick for platting, and keep them well closed up while settling.

My opinion is the kiln is fired too fast, the top bricks are not given time to become thoroughly heated.

The first object in burning a kiln of brick is to burn them well. Fuel and time are secondary matters and should never interfere with the success of a burn. In this case the setting may prevent free passage of heat from the arches.

Rome, Ga. R. B. MORRISON.

Reply to "A. Skimmer."

Editor Clay-Worker:

I read your letter in the October Clay-Worker, and can hardly say whether I was surprised or amused. If you make the statement in earnest that you sell brick for $5.25 per M and $2.97 of that is profit, it is one of the surprises of my life. I have bought a good many thousand dollars' worth of experience in the brick manufacturing business (machine process) but I never was so fortunate as to get any at your figures. I admit that my experience though costly, has taught me but little, and I claim to know but little about brickmaking now, but I admire and commend a man who has mastered the art to so successful a degree as you.

If you make $2.97 profit out of $5.25, the making costs you only $2.28, which is an achievement worthy of note. However, if you were only joking the "Village Brickmaker" in your letter, I would kindly beg of you to do it no more, as you might persuade him to attempt the impossibility of making brick at $2.28 per M which would cost him the profits of many years hard toil.

A. PAVER.

Tacoma, Wash.

Why Brick Are Made by Hand.

Editor Clay-Worker:

I suppose we will have to grin and bear it, but it certainly does make a fellow warm up, sometimes, to see the way the machine advocates "roast" us folks who still adhere to the old style of brickmaking. In the October Number, "A. Skimmer" gives it to us direct from the shoulder and predicts our total dissolution in a short time. In fact, he is almost as rough on us as Bro. Smith was when he told the members of the last Convention of his trip to Philadelphia and of his surprise at our ignorance in still making brick by the old method when he knew they could be made so much better and cheaper by machines. This is the cry of all machine advocates; also that we are slow and behind the times, and that it is madness for us to still continue making brick by hand and expect to keep up with the procession. It may be madness, but there is a method in our madness. We are all in the business to make money and to make the most money possible from the capital invested.

It takes the very best, strong clay to make machine brick properly and profitably. It is inexpedient to locate a machine upon a lot unless you have clay sufficient for 10 to 15 years. And there are very few such clay lots in Philadelphia, but there are vast quantities of weaker clays (more or less injured by the sand they contain) not adapted to machine brick making that can be so manipulated as to make first-class brick by hand. There are also numerous small clay beds throughout the city that can be worked profitably by hand where it would be folly to locate a machine. Last, but not least, we receive for good hand made brick a price considerable in excess of the best price for the average machine brick. This could not be otherwise, for when a builder wants to erect a neat, clean, smooth wall he must have hand made brick. The machine brick made here will not answer.

I have seen all the different kinds of machines in use in and about Philadelphia, and many in New York, New Jersey, Ohio, etc. As a result of my observations, I have concluded that cheap machine brick making means reduced wages and more work for the Labor. If we have to do this, then we want no machine in ours. We were not brought up that way. We pay our employes the highest wages paid for the same work in Philadelphia, our list averaging for the year 13 cents per M on our total output (9,000,000 or more) more than the Union scale of wages calls for. At the same time we have been reducing the day's work gradually, by doing all the extra work which the gangs usually do and paying for it ourselves. It is the opposite in the machine yards, they trying always to add a little more to the work to be done where the men are foolish enough to put up with it. I am not speaking of a small country yard either where the extra work would be light, but of one that runs 25 gangs and 9 Represses and makes over 7,000,000 common and 2,000,000 repress bricks.

With this I claim that we make better brick with less trouble, dispose of our stock with more ease and make as much money as any other firm in Philadelphia of the same capacity, and more than some firms that I know of who use machinery. Another suspicious fact in connection with cheap machine brickmaking is this—the least slackness that we have in trade, causes most of the machine yards to fill up with brick and then comes that cut in prices that the last Convention wrestled with to such little purpose. They do not appear to like the expense attached to piling up rough machine brick. I know it is expensive with any brick but more so with rough machine brick when the kind of labor usually used for that purpose is taken into consideration. Again, if you meet a brick manufacturer and he is crying "poverty, no profits, wages too high, have to make a change," etc., etc., nine times out of ten he has a machine, and it is left to the hand brick makers to try and maintain the wages at a living point for the men.

To sum up, I know this: If A. Skimmer only receives $5.25 per M and has a profit of $2.97, the men who make the brick and run the machine get mighty little of the $2.28 the brick cost, when the fuel, etc. is paid for. KALI.

Philadelphia, Pa.

Likes Continuous Kilns.

Editor Clay-Worker:

I wish brickmakers would come and see our Continuous Kiln work. They would soon be convinced that no other kiln can be compared with our kilns in regard to hardness of bricks, evenness in burning and cheapness in operation. There are quite a number of brickyards in and around Los Angeles. But our bricks have got the name of being the best ever produced in this country. The bricks I have made this year stand a pressure of 5,000 pounds to the cubic inch. I have tested them as to absorption. My average bricks absorb from 7 to 8.3 per cent. of their weight, but I have lots of bricks in the kiln that don't absorb over 5 per cent. During the rainy season I have made some bricks by hand and repressed them with a Raymond repress. Now I am burning these bricks and by giving them about the best place in the kiln they burn out just as nice and even in color as we can wish for.

Considering that the clay here is inferior compared with the clay in the East, we are making excellent brick, which we burn in Boehncke's Continuous Kilns.

My clay bank being from 10 to 25 feet high has from one to two and a half feet adobe or gumbo on top, the rest is hard, rocky sand with very little stuff similar to clay. Underneath this stuff I have clear, loose, white, in some places, yellow sand. The gumbo is the only binding stuff and I have to use considerable sand with it, to make it work in our Quaker machines. I am shipping most of the bricks to Los Angeles and we get from $1.00 to $1.50 more for them than the regular market price.

Very near all my bricks are sewer bricks and it is the same on the yard of the Sacramento Transportation Co., at Sacramento, Cal. They have two of the same kilns working with a daily capacity so 25,000 each and will put up a third one this fall. F. H.

Inglewood, Cal.

Believes in Progress.

Editor Clay-Worker:

I frequently get letters by means of and through the Clay-Worker making various inquiries about clay and brick. Mr. J. Dawson, of Sievern, S. C., writes and sends samples of his clay. He says: "I have read your letters in the Clay-Worker and think they are the best I have seen, and therefore now write you for ideas, as asked for, and I assure you it will be highly appreciated and paid for, if account is rendered by mail, with answer. I am going to send my subscription for Clay-Worker and hope to derive much knowledge from same."

I took pleasure in answering Mr. Dawson, of course, without charge. Mr. Dawson sent to me two specimens of clay, one was a very good sample of kaolin. There is a great deal of this valuable kind of clay in South Carolina, and when fairly developed, will prove a great source of wealth to the State. It will not only be valuable as material for the best kind of brick, but will go into all the finest grades of pottery.

Every important industry should have a literature.

I believe the Clay-Worker may be fairly set down as the pioneer in this line of mental work.

It is very gratifying to see that a new era has dawned on the oldest of human arts. The old crude thought and random style of brickmakers is fast giving way to intelligent study. New and improved methods are constantly being brought forward for brickmaking and burning, on principles well founded in theory and science, and though it will take a reasonable time to arrive at the best, or as the recondite say, "ultima thule," yet, healthy progress is now assured. As I have often said, we are soon to have a *clay building age*, instead of a *wood building age*. A most inconsiderate, extravagant, reckless use and destruction of our forests is rapidly going on. No town or city will stop combustible wooden building until it has all been reduced to ashes. A "*baloon*" frame building, at first, is cheaper than a good brick building, and many foolish people think that a wooden house is healthier than a brick house, and will pay as much or more rent for it, so the food for conflagration and decay multiplies; but all this, will soon change. The best kind of brick, will be made and used in building. The best kind of mortar and cement will be used, and intelligent men will lay the brick, or see that they are laid properly, instead of being half bedded in poor mortar. If a brick wall be put up in first-rate workman-like manner, within ninety days it will be as solid and strong as stone of the same dimensions. I would suggest a little more name to the Clay-Worker, I would call it "Clay-Worker and Bricklayer." Our bricklayers need a literature. They ought to know the theory and science of their work, and then, no builder should be allowed to employ any but the best workmen, and have the best kind of work. With a few exceptions, outside of bricklaying on U. S. work—done under best officers and master workmen—brick laying and building is illy done.

J. W. CRARY, SR.

New York News.

Editor Clay-Worker:

The principal topic of discussion in the building trades the past month was the series of short strikes on several of the down-town office buildings now going up, notably that of the Union Trust Co., Broadway and Wall Streets, and the Wilks Building, Wall and Broadway. The working men who went out, it seemed, had nothing to complain of against the builders, but their intention was to strike through them at the firm of Peck, Martin & Co., dealers in builders' supplies. The latter house had remained independent of union influences but had had no trouble with its men or with its customers, so that there was actually nothing to provoke the course of the boycotters except that the firm declined to place its business in the hands of the labor union. The following statement sets forth Peck, Martin & Co.'s position:

> **In answer to inquiries from various persons we wish to state definitely:**
>
> **First—There is no strike among our employes, and so far as we know there is no dissatisfaction.**
>
> **Second—Our employes are under no restraint from us as to whether or not they shall be members of any union. We are informed that among them are both union men and non-union men, but do not know in what proportions.**
>
> **Third—This boycott is laid by trades in no way connected with us. The bricklayers, plasterers, and laborers handle our materials without objection.**
>
> **Fourth—As a rule we are paying the highest current wages, believing that good wages secure the best and therefore the cheapest work.**
>
> **Fifth—As to the probable settlement of the matter we have no knowledge, as we have nothing to settle. We are prepared to fulfil all our contracts, and are daily making new contracts for future work.**
>
> Oct. 1, 1889. PECK, MARTIN & CO.

At one time it looked as though there might be a union stoppage to building operations in the city on account of this trouble, the trade recognizing the importance of the underlying issue and the manufacturers and wholesale dealers talking of uniting against the boycotters and selling no supplies to those who sided with them, but wiser councils have prevailed and a few days will probably see the matter satisfactorily adjusted.

The threatened glut in the brick market has not transpired and most probably will not, but this is due not at all to the strike, but rather to the fact that the brick has not come in as fast from the manufacturers as it was expected that it would. Those gentlemen are holding back most sensibly and the result is that the market keeps firm. There have been a number of rainy days and this has also retarded the making of brick somewhat. The demand for brick is lively. Haverstraws are quoted at from $6 to 6\frac{3}{8}$, while Up Rivers range from 5\frac{1}{4}$ to 5\frac{3}{4}$. Plans for new buildings are being sent in as lively as ever and if the weather permits the building season this year will be a remarkably long one. Among the new plans is one for a most peculiarly shaped building, so tall and narrow waisted that it looks like a light-house tower. It will be built at No. 25 Pine Street, and will cost $100,000. The front will be of limestone and pressed brick and the roof will be flat. It will have a frontage of 24 feet and its top will tower 118 feet above the curbstone. The building will be used for offices and it will run back 74 feet from the street.

BRIC-A-BRAC.

As Others See Us.

Editor Clay-Worker:

In answer to the publisher's kind invitation received today, to write something for publication in the Clay-Worker, I have much pleasure in sending the following:

Before proceeding further I would like to give expression to the very great enjoyment and profit with which I peruse said journal, which appears to me to be becoming, if possible, more attractive each issue. I cannot imagine how any clay worker, large or small, experienced or a novice, can afford to be without it, even if the cost were ten times what it is. I consider Mr. Crary's article on burning in the September number alone, probably saved me, on one kiln, more than fifty times the amount of a year's subscription. Of all the publications I receive from England and the States, not one is read with more pleasure than the Clay-Worker. It is refreshing to see the kindly spirit displayed by almost all your contributors, many of whom not only evidently know well what they are writing about, but are also able to clothe their ideas in well chosen and attractive language. There does not seem to be any petty jealousy amongst the craft; but the experienced appear always ready to help, in every way they can, those requiring aid, even though a possible competitor. This is a spirit of which I think a nation may justly be proud, and would be sought for in vain in any other land, with, perhaps, the exception of the old mother country. I may add that I have had occasion to communicate with several of your advertisers, from all of whom, without exception, I have received nothing but attention, courtesy and assistance. I would like to take the liberty of mentioning especially Mr. D. J. C. Arnold, to whom I sent a small order for clay shingle machinery, etc., which was forwarded with the greatest exactness and promptness, although the amount of invoice exceeded the remittance sent by over $100, as I had underestimated the prices of the dies ordered, and I was a perfect stranger to him. Also I would like to embrace this opportunity of publicly expressing my thanks to Mr. D. E. McQuaide, of the Climax Fire Brick Co., whose acquaintance I made here some time ago when he visited this place, in the petroleum interest. From him I have received much valuable advice and assistance, including many numbers of the Clay-Worker, to which, entirely of his own accord and at his own expense, he subscribed for me, just at the same time I had asked Mr. Arnold to do so.

You ask if I have a brick yard in operation. Though considered quite a wonderful affair here, I would be ashamed to honor it with the name, in a journal, read by men turning out their 200,000 bricks a day. .I have enclosed, a short distance from my dwelling, about 50 by 70 yards adjoining the street which follows the river bank in the suburbs and nicest part of town. At the back of the yard I have an "Old Reliable" outfit, a Raymond Perfection Press with dies for repressing clay shingles, flooring tiles, bricks, etc., drying sheds and pallets for about 12,000 bricks and a kiln which holds about 30,000. all leading towards the point of delivery, as advised by the Clay-Worker. I want to build two more kilns, but am still undecided as to the most suitable plan. I do not want to spend much money till I see how the business turns out. I have had more trouble with burning than anything else. The clay I get from an excavation to the rear of the machine. We are now at the close of the wet season here and I have experienced much inconvenience and loss from the exceedingly heavy rains. The mud bank has been full of water for some time, which started me in search of a supply elsewhere. This I think I have discovered in a very strong clay about 400 yards distant. I have many thousand acres of this clay should it ever prove valuable, as it may do some day, when this country will be inhabited by a race of people capable of developing its untold riches and resources. This clay, mixed with what I have been using, which is, I think, too sandy, will, I expect, give very good results. The clay working business is only an experiment with me at present, but it may develop into quite a business, and I mean to pursue it just as far as it goes. I am much taken with the business and often neglect other things to attend to it. My wife jokingly says she wishes I would give it up, that I can talk of nothing but clays and have to run out every half hour at night when there is a kiln on fire. Sometimes I do not go to bed at all. If not too tiresome I will tell you how I became associated with it.

Being unable to procure some bricks I needed, I determined to try my hand at making them, and, not fancying the usual method employed here for tempering the clay by tramping it out by the feet of mules and men, I spoke to a carpenter to make me some kind of a mud mill. He told me of an iron mudwing which had been lying idle for some years here. I accordingly called to see it, and not only found the mudwing, but an "Old Reliable" brick machine as good as new, which had been sent here 10 or 12 years ago and had been lying in a shed ever since. And now comes what with your kind assistance, I wish to give publicity to.

This machine had been bought by a Mexican gentleman engaged in making brick, etc., in the old Mexican fashion, a short description of which may prove interesting to some of your readers later on. Circulars and directions, etc., had, of course, accompanied the machine; but these, being in English, could not be read by the owner and were soon lost. The manner in which the machine was attempted to be operated was this: The mudwing was put up in a box made by boarding in four posts on the ground, and, so far as tempering the mud was concerned, which was deposited on the ground through a hole in the mill, did its work most satisfactorily. The mud was then conveyed in handfuls to the machine and put in through the opening at the back; but upon pressure being applied by the lever, it, of course, instead of filling the moulds properly, "spewed" out again where it had gone in. Several attempts were made to remedy this, such as fastening boards to half close the opening, etc., but very soon the machine was abandoned as useless, and quoted to all comers as an example of what swindlers the Americans were, etc. Some Americans who were here from time to time were shown the machine (but without the pug mill) and corroborated the statement, saying the machine had only been made to sell. The moment I saw the machine I said such was not the case, that it was quite impossible a machine so well made, could have been manufactured simply on the chance of selling one here and another there; and at once bought the entire outfit for $75. This was the price asked and probably double what it could have been bought for had I chosen to beat the price down. Every one laughed at me for having bought the machine, saying it was money thrown away. I then wrote to the makers, "The Tiffin Agricultural Works" and with that courtesy characteristic of all your patrons, by return mail not only had a full descriptive catalogue, but a long letter as well. I am ashamed to say that I have never had the politeness to write thanking them for the same, but I feel I have rendered them a much greater service, as the sequel will show, in proving them, not only an honest, honoraple firm, but one which turns out a machine, I should think second to none of its class. It is however, due to my own intelligence to state, that before receipt of their letter, etc., I had discoverek how the machine worked and had it up, etc. As soon as ready to commence operations, I invited a few of the leading men in town, including the late owner, to come down and see the first bricks made. Accordingly at 7 a. m. a number of gentlemen were announced. I had everything in readiness, the mud well soaked, the moulds and sand, etc., all in good order, so I at once took them out to the machine and showed them the empty pug mill, explaining how the clay was tempered by the knives and forced into the machine through the opening by the wings. I then proposed we should go in and breakfast while the men filled the machine, etc., giving orders at the same time, to first "hitch up" two of the mules, so that every shovelful should be well tempered as it went into the machine. After breakfast we again went out. With my own hands I sanded a mould, inserted it in the machine, pulled on the levers, and out came a full mould. I then cut off the surplus mud, scattered a handful of sand over the bricks to prevent them sticking to the pallet, bumped the mould like an old hand of 20 years' experience, and turned out six of as perfect bricks as ever came out of any machine. I then looked up with an air of triumphant satisfaction, and the expression on the countenances of the Mexicans was a picture worth seeing. The inevitable "*Caramba!*" burst simultaneously from every lip, "*Porque no tenemos nosotros Mexicanos cabazas como los extrangeros*" (Why have not we Mexicans heads like the foreigners?) In the mean time I had all the moulds sanded, and turned out mould after mould of beautiful bricks, almost as fast as the men could remove the pallets. "*Caramba! La maquina trabaja perfectemente bien.*" (Wonderful! The machine works perfectly). I then accompanied my guests to the gate where I bid them "*Adios,*" and could hear them for some time afterwards, in animated discussion far up the street.

I had intended, in addition to a short description of Mexican clay working, to give your readers some idea of the prices of labor, fuel, etc., and the value of the product here, also of some of the difficulties which beset the business, and indeed any undertaking in Mexico; but I am ashamed of the unreasonable length at which I have already trespassed upon your valuable space. I will therefore, with your permission, reserve further comment for a future occasion.

Tuxpan, Mexico. R. M. GREER.

Why Some Do Not Succeed In Making Dry Press Brick.

Editor Clay Worker::

There are some that do not succeed in the manufacture of dry press brick and some do succeed. Let us inquire into the causes of the want of success.

1st. They do not prepare their clay properly.

2nd. They do not care for them properly after they leave the press until they are set in the kiln.

PREPARATION OF THE CLAY.

We take the clay from the bank to dry yard and then let the wind, sun and rain dissolve it. After the weathering we pulverize it with a disk pulverizer and when the clay is dry we cart it into the store shed where it is allowed to remain long enough for the chemical elements to combine throughout the clay, or mulled as we call it. Then it will be in good condition for the pulverizer and press.

We find in our experience that clay must be tempered as carefully for dry press brick as for soft or stiff mud brick to get the best results.

CARE OF BRICK AFTER LEAVING THE PRESS.

The brick are taken from the press to dry floor and dried. They are not so liable to damage in watersmoking if they are dried on a dry floor. If you have no dry floor put them on pallets and set them in racks in the shade or hack them in hacks ten to fourteen high and let them dry out thoroughly, for there will be plenty of moisture in any dry press brick. Afterwards, set in kiln and burn as any dry press brick is burned, first using especial care in the watersmoking.

Our brick compare favorably with any brick made by the dry press process in this country. They are hard as steel, ring like a bell, and deep red in color. My method of burning is practically the same as that of J. W. Crary, Sr., who has written some very valuable articles for the Clay-Worker, and the Clay-Worker should be in the hands of every brickmaker. "Long may it wave."

J. D. PRATT.

A Strange Case.

Editor Clay-Worker:

Our company has a mountain of debris hoisted from its coal mines consisting of fire clay and soapstone or shale mixed. This product when left in large heaps, fires by spontaneous combustion and becomes a red color and dry almost like a cement; left in smaller piles, it rots or slacks down and becomes a homogeneous mass of clay and does not fire. The soapstone, especially, slacks to a smooth, soft, mealy clay apparently suitable for the dry press.

I should like to hear from your correspondents as to what may be done with the mountain of burned stuff in making paving brick or some other clay product and also as to the feasibility of making a dry pressed brick out of the soapstone. The experience of parties who have worked such clay will be very welcome.

E. L. MONSER.

CHICAGO WILL BE THERE.

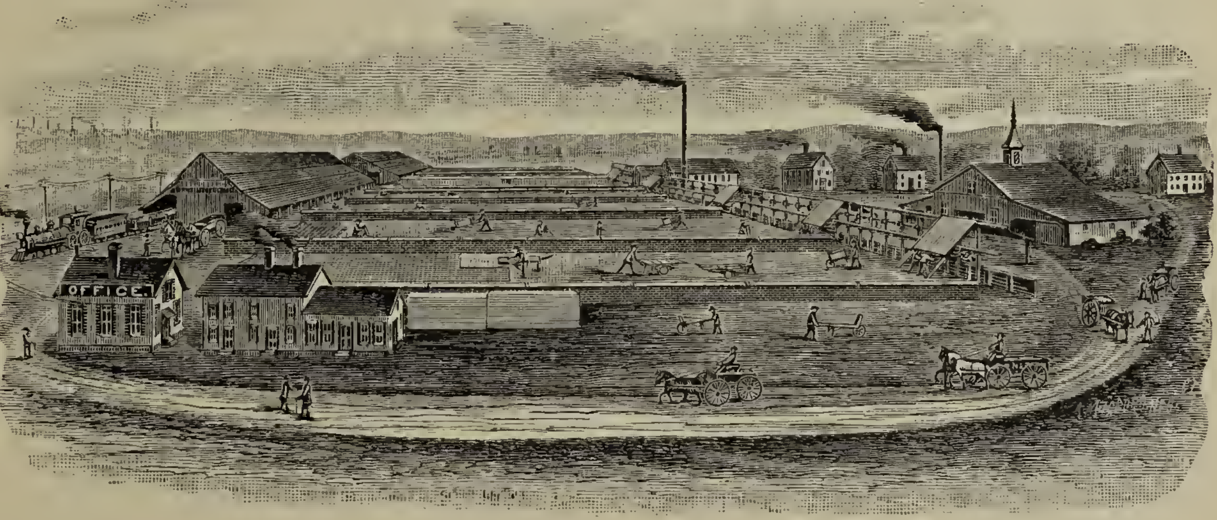
Our Chicago friends are making ready to attend the meeting of the National Association at Philadelphia. They have always added much to the interest of these annual gatherings. They have a snap and ring of enterprise that will locate them even in the dark, and which makes them conspicuous in the light. We have at times admired their reticence, but we note the fact that when they want the floor they generally get it. If there are great undertakings to be engaged in, they are equal to the task. Come on, Chicago, one hundred strong, or more.

BRICK YARD SKETCHES.

C. P. Merwin's Model Works at Berlin, Connecticut.

One minute's walk from the railway station at Berlin, Conn., brings us to the now widely known brick yards of our esteemed friend, Chas. P. Merwin, Recording Secretary of the National Brick Manufacturers' Association. Those who know Mr. Merwin personally need not be told that everything about the plant is in good working order, for he will not tolerate anything that is not systematic. An idea of the extent and character of the plant may be obtained from the accompanying illustration which does not do the works justice, however.

Mr. Merwin owns three hundred acres of clay land on which the factory is located, thus insuring an ample supply of excellent clay for several generations to come, and it is all easily accessible. The office and yard are contiguous to the track of the Hartford railroad, so that the loading of cars is most convenient, while material for the kiln fires can be unloaded with equal facility and proximity. Mr. Merwin is fortunate, moreover, in having no less than six railroad fronts to his clay fields, an advantage easily discernible. The brick manufactured by Mr. Merwin are unexcelled in quality and command a wide market all over the State of Connecticut, Southern Massachusetts and Rhode Island. He has a large demand for his brick from the leading builders of the city of Providence and of many other places. While the quality of the clay is unsurpassed, Mr. Merwin spares no pains or means to secure the best possible results, as is seen in the use of the latest and most approved appliances, machines and machinery. Six machines were at work yesterday when we visited the premises. This is an age of electricity, dynamite, smokeless powder, etc., and Mr. Merwin, to expedite the loosening or breaking up of the clay for the carts, employs dynamite, which does all that is required, loosening great masses and breaking them in fragments ready for the easy application of the pick and shovel; the dynamite magazine being about 3,000 feet away, while the explosion of the dynamite is accomplished by means of electricity, thereby avoiding all danger. The capacity of the works is 160,000 brick per day.



C. P. MERWIN'S BRICK YARD, AT BERLIN, CON.

The most recent addition to the plant is a new Penfield upright stock brick machine with pug mill attached. It is a very heavy machine being built entirely of iron and steel, and turns out a fine grade of stock brick. Mr. Merwin is much pleased with it and will put in more of them the coming season. He is also investigating artificial dryers with a view of adopting that system instead of the rack and pallet which he now uses. Mr. Merwin's success is gratifying, though no surprise to those who know him, for his great energy and intelligence would brook nothing less.

Mr. Merwin is a most ardent advocate and supporter of the National Brick Manufacturers' Association and has recently written hundreds of personal letters to the brickmakers throughout New England telling of the coming convention in Philadelphia and urging all to come and take part in the work. The result we trust will be an attendance from that section that will gladden the heart of our worthy Recording Secretary. May he live long and prosper.

IN AND ABOUT PHILADELPHIA.

After a long but pleasant journey over the picturesque Chesapeake and Ohio R. R. we recently arrived at Philadelphia, and to our delight found waiting a note from friend Geo. W. Sharer, saying that Mr. J. A. Blaffer, of New Orleans, was also a visitor in the city of brotherly love and requesting that on the following day we together make a trip to the brick yards. It is needless to say that the invitation was accepted and that a pleasant day of sight seeing among the Quaker brickmakers resulted. We had not met friend Blaffer since the first annual convention of the N. B. M. A. at Cincinnati in 1886, where he was honored with the first vice presidency of that body, an office he fillen to perfection, winning the admiration of all who then gained the title of "Charter Member," a distinction that will be held in higher esteem as the good work then inaugurated continues, and is better appreciated by the craftsmen generally. Before visiting the brick yards we were treated to a fine drive through Fairmount Park by Mr. Murell Dobbins, who, like all good Quakers, takes special pleasure in showing visitors the beauties of that resort while holding the reins on a splendid team of thoroughbreds, as fleet, almost, as the wind. The Quaker brethren *may* be slow but they don't drive that way, at least friend Dobbins does not.

A TIDY FACTORY.

The first brick yard visited was that of SINER BROS., near Frankfort Junction, on the Pennsylvania Railroad, where we were cordially welcomed by both members of the firm, who, it seems, have a habit of looking closely to their business affairs. Brother Blaffer remarked that there was an air of order and industry about the works that bespoke of good management. From the engine room through to the sorting sheds everything was tidy (if such an expression may be used in connection with a brick yard) and in place. The clay is carted to a platform above a Newell pulverizer which quickly grinds up the clods and lumps leaving the clay in good condition for the pug mill to which it is conveyed on a belt and by it in turn fed into a Martin machine. The molds are sanded by a Newton sander. From machine the brick are dumped on metal pallets placed on a revolving mold table and then piled on iron cars, holding 420 brick, and are next pushed into a Sharer tunnel drier, cut of which may be seen on page 290, which Mr. Siner commends very highly. It is a ten tunnel drier, each tunnel is 100 feet long holding fourteen cars. From the drier the brick go to the kilns (Sharer's patent) which hold 200,000 or more each. A new kiln of Mr. Siner's designing was in course of construction at the time of our visit which they believe will be an improvement on the old ones. At any rate it will prove a durable one for it is built regardless of expense, the walls being exceptionally heavy and lined inside eight or ten high with fire brick.

The kiln will probably be completed and fired before the coming convention when the brethren, who will be invited to visit the yard, can then judge of its merits for themselves.

One feature of this yard worth mentioning is a clay storage shed near the machine where surplus clay is dumped from time to time, thus providing a supply that may be drawn on when bad weather prevents them from hauling from the bank.

They employ 21 hands on this yard and make 28,500 brick a day. They also have an old style outdoor yard in the same vicinity where they make both by machine and by hand and burn in old style Dutch kilns.

Messrs. Siner Bros., may their shadows never grow less, are evidently prospering, as industrious brickmakers should.

The next yard inspected was that of

THE JARDEN BRICK CO.,

which we visited in company with Mr. Seymour, the affable representative of Messrs. I. & M. Wolff & Coleman, of Chicago, to whom we are indebted for various favors. The Jarden Brick Co. is a new stock company recently organized with a capital of $1,000,000, a goodly portion of which they are investing in new machinery, driers and other modern appliances. They succeed to the business of L. E. Jarden & Co., which is among the oldest firms of brick manufacturers in Philadelphia, the business having originally been established by the late Jacob Jarden in 1836.

The new company is composed of Mr. H. C. Webster, Wm. L. Elkins, P. A. B. Widener, Chas. E. Yerkes and W. L. Gregg.

At the time of our visit the yard was in a chaotic condition owing to the reconstruction of the plant which is being enlarged on an extensive and elaborate scale. When completed the works will really be two plants in one—the old, a soft clay yard, and the new, a dry clay factory on the Gregg system. On the former they are building an Iron Clay Dryer, under the direction of Messrs. I. & M. Wolff & Coleman, which will make them more independent of the weather and insure a more regular and uniform output.

We were much impressed by the thorough manner in which the improvements are being made. Everything is thoroughly well done. The drying tunnels being whitewashed inside and painted outside, making a neat and attractive plant, in striking contrast with what we usually see about a brick yard.

They run two Martin machines with crusher and pug mills attached and will put in three more. They also run several hand gangs for whom the clay is tempered with the old style tempering wheels. They have been making about twenty million brick a year and intend to increase their capacity to sixty million.

THE DRY PRESS PLANT,

we had been informed before reaching the yard, was not open to visitors, but this we found was not the case, but on the contrary we were very kindly shown all over the place by Mr. J. L. Hill, the Mechanical Engineer, under whose supervision the works are being constructed and put in operation. The Gregg system of machinery is the one adopted. They were running one double and one single machine, making 25,000 and 12,000 brick a day respectively. The clay is carted to the sheds, a little distance from the machines, is first passed through a crusher, which reduces the large lumps, and is then conveyed to a Gregg pulverizer above the machine, which reduces it to a fine powder, when it is fed down into the machines, which are of the semi-dry order. From the machine they are placed on cars of peculiar construction and conveyed to a tunnel drier, thence to the kilns.

The finer grades of ornamental brick are made in the same fashion, but on hand or screw presses similar to the one illustrated on page 340. The clay for each brick is weighed out by a boy who puts just the exact amount in each mold. It is then first carefully pressed into the mold by hand, after which the upper part of the mold or die is forced down upon it by screw pressure. The brick thus made are beautiful in form and finish and there is no limit to the designs that may be produced.

These plants will be in operation during the convention, when the delegates will be invited to visit them and see for themselves, just how the work is done.

The works are under the management of Mr. H. C. Webster, who is also president of the company, and a most agreeable gentleman. If he is as successful in making brick as in entertaining his friends and visitors the Jarden Brick Company has a very bright future indeed.

On our return journey we stopped at

MR. MURRELL DOBBINS' YARD,

but unfortunately missed him, he being at another of his yards, of which he has four, one at Long Lane and Mifflin Streets, where he uses a Chambers' "B" machine, and turns out about eight millions during the season. Another yard at 23rd and Passyunk Avenue, where he uses a Martin machine for common, making stretchers and paving bricks by hand and repress a portion of the Martin machine brick. The capacity of this yard is about seven millions and having a Sharer drier here, he can run nearly all the year, if trade demands it. This yard will probably be running during the convention and all who wish to visit it will be given an opportunity to do so. He has one yard at Kinkora, N. J., on the line of the Pennsylvania R. R. and Delaware River, about twenty-five miles above Philadelphia, where nothing is made but rough brick, using a Chambers' machine and tunnel driers. The output of this yard is probably seven millions a year.

His other yard, at Florence, N. J., is on the Delaware River about a mile below Kinkora. He uses there a Chambers' machine and makes four millions. Here is some of the finest clay in this section suitable for the manufacture of anything that can be made of clay. Under the clay bed there is some very good kaolin, which Mr. Dobbins intends to put on the market soon.

He has his own schooners and scows, built purposely for carrying brick, and can deliver from the Jersey yards anywhere along the river front cheaper than the yards in the city.

In addition to the four brick yards having a combined capacity of twenty-six millions per annum, Mr. Dobbins has a stock farm of 300 acres well stocked with horses, sheep and cattle, which one would think was enough to keep him out of mischief, and we think it does, at any rate we have heard of no mischief of his doing, but we have heard Mr. Dobbins spoken of as the most generous host in all Philadelphia, and though that is indeed high praise, we, from our own experience, have no reason to doubt it.

THOS. B. MCAVOY'S YARDS.

There is one conspicuous figure among the craftsmen in the city of Brotherly Love which cannot be overlooked. Per force of circumstances our friend, McAvoy, looks down upon his associates who, in turn, look up to him. Yet it may be said of truth, that he is every inch a man. Dame Nature has endowed him not only with great physical strength, but as well with a kindly, generous nature that makes him a general favorite among his fellows From this, the reader will know that the visit with him to his, and his neighbor's yards was a pleasant trip, made still more pleasant by the company of Recording Secretary, Merwin. Mr. McAvoy's yards—which he has placed in charge of his sons, and wisely, too, we judge, for they are thorough-going and painstaking brickmakers who can give many older heads pointers—are hand yards. We visited but one and found them getting things in readiness to close down for the season. A noticeable, and to us a new, departure, was the method of driving the tempering wheels. They use steam power, but where it is applied is a curiosity and puzzle to the visitor. No gearing or shafting is visible, yet round and round go the wheels driven, it seems, by magic power. The mystery(?) was quickly explained by Mr. McAvoy telling of an underground tunnel, four feet six inches deep, and four feet wide, built especially for the purpose, through which the shafting, 150 feet long, is carried. There are three pits, each holding clay for 20,000 brick which are tempered by wheels connecting with this shaft. The system is very satisfactory and has proven much better and cheaper than horsepower, formerly used. The brick are made in iron molds, one at a time, and dumped on the yard. When dry, they are burned in the old style Dutch kilns, with coal. Both hard and soft coal is used, the former costing $3.00, and the latter $5.00, a ton. About one-fourth of their entire output is repressed by hand, and burned with the common brick. A kiln was being emptied when we were at the yard. The brick were very good and hard up to within a course or two of the top. The green brick measure 8½x4¼x2⅝, and when burned, 8⅜x4⅛x½. In the shed were piled a fine lot of fronts and stretchers that for color and form, are hard to beat.

From Mr. McAvoy's, we were driven across the city to

FLOOD BROTHERS YARD,

at 2747 Frankfort Ave., where we found that prince of good fellows, T. H. Flood, and, to us, a more familiar scene, this being a machine yard with Sharer's patent driers and kilns. The clay is hauled in carts to a platform, beneath which is a Penfield Crusher, from which a belt carries it to the pug mill which, in turn, feeds it into a Carnell soft clay machine, which makes 25 M a day, and could make more. From the machine, the brick are placed on iron pallets, and on iron cars are taken to the drier, which has ten tunnels, 120 feet long. The brick come from the tunnel bone dry, ready for the kiln. Mr. Flood spoke very favorably of the drier and kilns both, and also of the machine, which he considers A No. 1.

After looking around the yard hurriedly, we "surrounded" Mr. Flood and persuaded him to join us, and the party then became one bent on pleasure alone, with no heed or care for bricks that are made of clay.

We visited several other yards of which we wish to speak, but as we write, the voice of the compo. rings in our ears, crying: "Hold, enough!" and we lay down the pencil and defer further comment on the trip, which was in every respect a most pleasant one, till the following (December) Clay-Worker.

THE BENEFITS OF ASSOCIATION.

A few Reasons why Brickmakers should Attend the coming National Convention.

There are numberless reasons why a broadly extended trade like that of brickmaking should be thoroughly organized, and there are none why they should not be. In this day of the railroad and telegraph, of rapid transportation and instantaneous dissemination of intelligence, of large capitalization of industry and what is more than all, the concentration of general interests, a trade is neglecting its greatest opportunities when it fails to be broadly and thoroughly organized. There is the social phase of its meetings, bringing about new and often lasting friendships. There are the men whose callings are similar, each with some peculiarity in his own method to impart, or some experience in his own business to be avoided or followed. There will be the place to discuss improvements or exchange experiences or discuss reforms. The time has passed when a man or even a trade, can build a fence about himself or his trade interests, and depend upon his own resources, or the little local trade that might happen to be about him. There is now no locality in that restricted sense. Every brickmaker is interested in the doings of other craftsmen and is tied up with them for good or ill. But taking the broadest view of this process of organization going on throughout the civilized world and leaving out any mere question of commercial advantages that may or may not be practical, there is one that is comprised in the mere bringing together of the sentiment and intelligence of a large and widely extended industry.

It is not an experiment, but it is a fact, that this bringing together of people who have a common interest, has largely been instrumental in raising the American people as a whole, beyond and higher than any other people. It has done this because it brings all together where the brightest minds fertilize the whole. There is not a single individual who will attend these meetings but will receive some educational benefit from each member and from the whole, and the brightest minds are sure to impart to the others some degree of their fertility and in return, receive it from the whole. No worker in clay can afford to miss this meeting, nor can the meeting afford to miss the man. The Association will be whatever its individuals choose to make it, and it will reflect back all that the individuals who compose it give to it.

CINCINNATI TO PHILADELPHIA.

Our honored ex-president, W. A. Eudaly, who has from the first convention held in Cincinnati in 1886, been among the most enthusiastic supporters of the National Brick Manufacturers' Association, is organizing an excursion party to the coming annual meeting in Philadelphia. His idea is to have those in the vicinity of Cincinnati, who will attend the convention, form a party and charter one or more Pullman sleepers for the trip. The plan is a good one and should meet with favor from all who can make Cincinnati their starting point. Craftsmen from points West or South can buy tickets via Cincinnati and join Mr. Eudaly's party there.

It is now proposed to leave Cincinnati Sunday, December 8th, at 6:30 P. M., by the C. & O., F. F. V. Vestibule Limited, one of the finest through trains in America, arriving in Philadelphia, Monday evening at 6:15.

A round trip rate of one and one-third fare has been made by this route. By chartering a sleeper that expense will be lessened.

Those who know our genial ex-president need not be told that all who go under his leadership will have an enjoyable trip. There will be a strong, deep current of good fellowship that will be liable at times to bubble into hilarity and make the journey a very pleasant one. We have traveled with him and speak from experience.

Those who can go that way should write Mr. W. A. Eudaly, 64 Johnston Building, Cincinnati, for exact information. He requests that applications for berths in sleeper be made on or before December 5th, in order that ample accommodations may be provided for all.

THE BARRINGTON BRICK CO.

A correspondent whom we supposed to be reliable, sent for publication in the October issue of the Clay-Worker, a very complimentary notice of the Barrington Brick Co., of Barrington, R. I. The last few days have developed some facts that are not creditable to the managers of this Company, to say the least. The scheme, so far as can be seen at this writing, was set up to induce conservative capitalists to invest their money, and intrust the management to men who have proved themselves unworthy of the confidence reposed in them. A committee of honorable men have been appointed to investigate matters, and it is believed by some that the Company will be found to be thirty thousand dollars in debt and the main plant on leased land.

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14 & 16 S. Tenn. St., Indianapolis, Ind.

THANKSGIVING---RETROSPECT.

The year now drawing to a close has been one of signal success in many lines of business. The brickmaking industry throughout the country has been prosperous, excepting localities where the continuous rains have seriously effected the business. Prices have been quite well maintained, excepting only a few localities. Brick is being more generally recognized as the best and cheapest material. In addition much more attention is being given to the use of ornamental brick and terra cotta. Brick for street paving is exciting much attention, and bids fair to supplant many other kinds of material that have been used for the purpose. The manufacturers of clay working machinery have had a prosperous trade. There has been a general advance in the added improvements to increase the efficiency and durability of much of this class of machinery. In looking over the list of our advertising patrons and the large line of clay working machinery illustrated we feel especially proud of the exhibit, and the advance that has been made in the past half decade of years. It is really marvelous.

As publishers of a clay working journal we have every reason to be thankful for the success we have achieved the past year. We have made a large and healthful growth. Our subscription list has increased beyond our most sanguine expectations. We appreciate fully, the many favors poured out upon us without measure, by our host of friends and readers throughout the country.

Let us, then, one and all, when the annual feast day comes again, go to the Thanksgiving table and partake of the turkey and other good things so plentiful with hearts overflowing for the bounties of the year.

A HEALTHY GROWTH.

"Tall oaks from little acorns grow," but they do not grow to their full size in a day nor in a month, but it is the work of years. As the roots reach out and down into the earth, taking fast hold upon it, the branches above extend, enlarge and become stronger. The development goes on year after year, laying on growth upon growth. The crowning foliage pushes itself higher and higher up into the blue of the heavens. The winds blow but to make it stronger, the sun shines and deepens the living green, the balmy air brings food and life, and the rain waters it. The years go by and the small, budding acorn becomes the majestic oak, but the development of roots and branches has been gradual. The annual growths may have been large but they were year by year.

So it is with successful periodical publications; it is the work of years. They must be deep rooted to support the body and branches. They must prove their strength and sturdiness by actual tests. Each day in the added years of their existence may bring larger growth if the conditions are favorable, but the enlargement must be healthy and not abnormal. The leading publications of the age have had this same gradual growth. Their patrons have learned to welcome their coming as they welcome the face of a friend; to rely upon their columns for information, to trust their statements and to follow their lead in many things.

There is no such thing as vaulting into the saddle of public confidence and support at one bound. It takes time, labor, experience and acquaintance; there must be a mutual confidence growing with the growth, and strengthening with the strength. It is not to be expected that a publication (it matters not what it claims) will have a large share of public confidence until it merits it.

Publications have characters the same as individuals and good characters are the result of "being of ten triedand never denied" in the testing. Characters are not necessarily what is claimed to be, but what they are found to be in the run of years. Nothing is truer than this in determining the merits of a publication.

STRAY CONVENTION NOTES.

No city in the Union offers more of interest to brickmakers than Philadelphia. It is the nestor of American brickmaking and every craftsman in the land who can, should take in the Contion. It will pay. Try it.

The Philadelphia brickmakers are thoroughly aroused as to the importance of the Convention work. Nothing that they can do to make the meeting a success, will be left undone. The right hand of fellowship, and a most hearty welcome will be extended to every visitor. There is a love feast in store fo all. Don't miss it.

Brick manufacturers will find it to their advantage, in dollars and cents, to bring their foremen and superintendents with them to the Convention. The information gained will prove a paying investment. Come yourself, and bring your wide-awake, intelligent superintendent with you. You will be the gainer in the end.

Every craftsman who is meeting with difficulties in any of the various details of the business should come to the Convention and let his tribulations be known, and the chances are nine to one that he will receive information that will enable him to overcome the trouble. In this connection, we wish to call especial attention to the QUESTION BOX. If properly used, it will prove a rich source of discussion on matters of much importance that otherwise may be entirely overlooked. Use your thinker and your pencil together, fellow craftsmen. Come to the Convention for a purpose. Know what you want to know; ask for what you want and the chances are, you will receive it. Don't forget the Question Box.

KEEP YOUR EYES ON US.

We are in receipt of some very interesting and instructive letters from both new and old contributors that we are unable to get into this issue, which will be given to our readers in the following one. In the preceding number we stated that this issue would be an exceptionally valuable one. Look through it and you will admit that *it is* all of that.

We believe that it contains more original, practical and interesting matter on brickmaking and kindred interests than was ever before bound between two covers of a periodical.

Look out for the Dec'r Clay-Worker!

THE CLAY-WORKER. TO

25 THORPE BL'K.

Indianapolis,

Ind.

INDIANAPO

MANUFACTURERS OF BRICK, TILE, POTTERY

We hand you this SAMPL
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EDITORIAL NOTES and CLIPPINGS.

A pottery will be erected at Ottay, San Diego, Cal.

The Pains (Mich.) Brick Co. has been organized.

It is proposed to start a pottery near Addie, N. C.

B. P. Eagan is making paving brick at Omaha, Neb.

S. D. Lloyd will build a brick yard at Beattysville, Ky.

W. H. Clark has started a brick yard near Corning, Ark.

W. G. McDowell has started a brick yard at Lexington, Ky.

Alton, Ill., wants a paving brick company established there.

Henry Flood, Stutgart, Ark., has purchased brick machinery.

Owen Hatten, an old brickmaker of Philadelphia, died Oct. 20th last.

H. V. Hardwick, of Almon, Ga., may build a brick yard in that vicinity.

Don't forget to mention the Clay-Worker when writing to advertisers.

The Capital Pressed Brick & Paving Co., Topeka, Kan., is now under way.

The Olympia (Wash.) Brick & Tile Co., has been organized. Capital, $20,000.

Rufus Tibbetts, a well-known brickmaker of Portland, Me., died Oct. 20th.

The Fenn Brick Co., Leavenworth, Kan., has been chartered. Capital stock, $40,000.

Az. England, of Havanna, Ill., proposes to put an additional brick machine in his yard.

Robt. Logan & Son will start a new brick yard at McKeesport, near Pittsburgh, Pa.

Evansville (Ind.) Pressed Brick Co., will put in additional brickmaking machinery.

It is claimed that a large and valuable bank of clay has been located near Trenton, Ga.

Brick works are to be erected at Vicksburgh, Miss., by the L. N. O. & T. R. R., of Memphis.

P. Hansen, of Deadwood, S. Dak., will purchase a brick machine and start a small yard.

The Denver (Col.) Sewer Pipe & Clay Co. has been incorporated, by James H. Green and others.

Chauncey Williams, Troy, N. Y., recently, successfully burned a kiln containing 800,000 brick.

Lovett Bros., McKeesport, Pa., are preparing to run their brick yard at Elrods throughout the winter.

Messrs. Perot, Collier & Call have purchased a brick yard at Tacoma, Wash., and will add machinery, etc.

Jno. C. Hodges, Jr., and others, of Denver, Col., have organized the Globe Brick Co., with $200,000 capital.

T. A. Bingham, and others, have organized the Meridian Brick Works at Tacoma, Wash. Capital $45,000.

The Old Bridge (N. J.) Tile Co. has been organized by Sherman Van Ness and others. Capital $12,000. Will make tile.

Midland Brick Co., Chicago, Ill., has been incorporated by J. A. Sleeper, Julius Starrett and E. W. Ehrlich. Capital, $200,000.

The Puget Sound Brick, Tile & Terra Cotta Co., of Tacoma, Wash., has been organized. Capital, $100,000. W. C. Hill is Superintendent.

A Beatrice (Neb.) syndidate recently purchased thirty acres of clay land near Table Rock, Neb., of C. H. Norris, and will build a brick and tile factory.

The Kissel Fire Brick Co., Rochester, N. H., have imported a brick press from England. Pity they couldn't get a better one on this side of the water.

The Portable Brick Drier Company, Chicago, has been incorporated by David O. Shea, Edmund Christie and Martin Carroll. Capital $40,000, They propose to manufacture brick driers and machinery.

Winslow & Co., of Portland, Maine, have ordered Automatic Presses of C. W. Raymond & Co. They are extensive manufacturers of fire brick, having, probably, the largest establishment in the East.

The demand for the Detachable Chain Belting and Conveying Machinery, manufactured by the Jeffrey Mfg. Co., of Columbus, Ohio, is good, judging from the many orders which this company has on their order books.

Jonathan Creager's Sons have completed and will soon show cuts of an improved combination Chilled Roll Disintegrator and Differential Smooth Roll Crusher especially adapted to preparing clay for dry and semi-dry brick making.

Nathan Stedman, of Aurora, Ind., manufacturer of the well known "Stedman" Pulverizer, writes: "Business is very good with us. Our Improved Disintegrator is gaining in favor rapidly. We owe a great portion of our orders to our advertisement in the Clay-Worker." Moral: It pays to advertise—in the Clay-Worker.

The Frey-Sheckler Co., of Bucyrus, O., report that their trade keeps up as brisk as ever. The late improvements on the large Double Power Repress proved a complete success. A smaller size is now being constructed, somewhat on the same plan. A new, very heavy auger machine, with five-inch steel shaft, steel knives in steel socket, with open pug mill combined is also being made. We also learn that they have made additional improvements on their buildings and are putting in new machinery.

Messrs. C. W. Raymond & Co. of Dayton, O., took a large subcontract on the Lick Run Sewer, at Cincinnati, O., of furnishing 24 of their Dumping Cars and 1,200 feet of Portable Track. The entire shipment will occupy about five ordinary freight cars and will be made complete on Nov. 5th. The Lick Run Sewer is famous in that it is said to be the largest in the world.

Fletcher & Thomas, Indianapolis, Ind., report the brick trade of this city as never better at this time of year, with prices advanced to a satisfactory figure. They report their prospects for the coming year in the brick machine line, as very flattering. The sales of the New Improved Quaker the past season were very large, and the entire satisfaction given was such that they look for double the business in 1890.

C. & A. Potts & Co. report trade as being universally good the past month, the following being a part of the month's shipments: Eight Disintegrators to one firm at Porland, Oregon; one Combined Pug Mill and Disintegrator to Spokane Falls, W. T.; one Disintegrator, Elevator, etc., to Scottsdale, Pa.; one Combined Pug Mill and Disintegrator to Lock No. 4, Pa.; four Mould Sanders to one firm of brick machine manufacturers. They have now booked orders for two Horizontal Brick Machines, Disintegrators, Clay Pullers and Elevators for one firm in Wisconsin. One complete outfit, including Horizontal Stock Brick Machine, Disintegrators, Elevators, Sander and 40 h.p. Engine and Boiler for Pennsylvania.

THE CONTINENTAL HOTEL.

Which will be the home of most of the delegates to the Brickmakers' Convention during their stay in Philadelphia, is one of the best known hotels in America. The selection of the Continental is a credit to the Hotel Committee for it is conveniently located, being but a short distance from the Convention Hall. It is situated in the center of the city convenient for shopping, theatres and general business.

Although within easy walking distance of the railroad stations, an omnibus meets all trains at the Broad Sreet Station and carries passengers to and from the hotel at the nominal charge of ten cents. Those who wish may take a Chestnut street car, which passes the door of the hotel.

The Continental contains over four hundred sleeping rooms, which are neat and cosy, while the spacious parlors, dining rooms and halls are unsurpassed. The service in the dining rooms and throughout the hotel is most excellent. Every modern convenience is provided, including fire escapes, and a supply of water from their own artesian well 240 feet deep.

Those who will be accompanied by ladies, especially, should notify the hotel of their coming, and order rooms reserved in order to obtain desirable locations. This will cost nothing but a two-cent stamp and the trouble of writing a letter, so do not neglect it. When registering at the Continental inform the clerk that you are a delegate to the N. B. M. A., in order that there may be no misunderstanding.

Go to the Convention and stop at the Continental.

THE F. F. V. TO PHILADELPHIA.

The finest train between the West and the East, is the F. F. V. (Fast Flying Virginian), over the Chesapeake and Ohio Route, which runs to Washington, Baltimore, Philadelphia and New York, leaving Cincinnati at 6:30 P.M. and reaching Philadelphia at 6:15, the next evening. These facts are of interest to those who will atteend the coming Annual Convention of the National Brick Manufacturers' Association, which meets in Philadelphia, December 10. The train leaves the Union Depot, Cincinnat, upon the arrival of trains from Indianapolis, St. Louis and the West.

284

This train has won fame for the new management on the C. & O. It is an elegantly and luxuriously appointed limited train, vestibuled from end to end, heated with steam from the engine and lighted with electricity. It runs through solid to New York, and is the only vestibuled limited with through dining car between Cincinnati and the East. The dining car is under the management of the Pullman Company and is equipped with every appointment of a first-class hotel, the menu comprising every delicacy. Meals are served *table d'hote* at the uniform price of $1.00

The C. & O. Route to Philadelphia is the most picturesque and beautiful in North America. Its charms are as varied as they are striking: The Ohio River for 160 miles, then the wild and roaring New River in its rock-ribbed canons, its banks lined with blazing coke ovens, then the towering Alleghanies and the soft Blue Ridge. All these and many other features engage the traveler's attention.

The rate of fare to the Convention will be one and one-third fare for the round trip. For information as to rates, etc., apply to agents of connecting lines, or address

H. W. FULLER,
Gen'l Pass. Agent, Cincinnati, O.

Our "English Letter" did not reach us in time to enable us to have the engraving made, showing the plan of continuous kiln to which reference was made in the October issue, page 241. It will appear, however, in the following number and will, no doubt, prove very interesting to many of our readers.

Our readers will pardon us, we feel sure, for having so much to say of Philadelphia and Philadelphia interests in this issue. In view of the coming meeting there, we think these matters of special interest to the craft just at this time.

Willis E. Everett, geologist and mining expert, of Tacoma, Wash., is authority for the statement that within a few hours ride from that city are large beds of various kinds of clay, including fire clay, slip glaze clay, porcelain and pipe clay.

OUR 1889 CATALOGUE

Is in Printer's hands. Parties desirous of obtaining same will please forward their address at once to insure prompt mailing. Address,

Link-Belt Machinery Co.,
CHICAGO & MINNEAPOLIS,

---OR---

Link-Belt Engineering Co.,
NICETOWN, PHILADELPHIA, PA., &
49 DEY ST., NEW YORK, N. Y

[Mention the Clay-Worker].

CRUDE PETROLEUM AIR BLAST FIRES
FOR THE MANUFACTURE OF
BRICK, - TILE, - CROCKERY, - GLASS AND SEWER PIPE,
BY THE
AERATED FUEL COMPANY,
(425 MAIN ST., SPRINGFIELD, MASS., U. S. A.)
COMPRESSED AIR SYSTEM—PATENTED—
OIL ALWAYS BELOW BURNERS—WE GUARANTEE INSURANCE WHEN PLANT IS INSTALLED ACCORDING TO OUR SPECIFICATIONS.
ALSO
FORGING - WELDING - BRAZING - ANNEALING - STEAMING AND OTHER PURPOSES.
WE ARE REPRESENTED BY

W. S. COLLINS, 171 Broadway, (Suite 24), New York.
ALDEN SPEARE'S SON & CO., 3 Central Wharf, Boston, Mass.
WM. PICKETT, SON & CO., 170 Lake St., Chicago, Ill.
CHILION JONES, Gananoque, Ontario.
G. M. SMITH, Los Angeles, Cal.
KALAMAZOO SPRING AND AXLE COMPANY, Kalamazoo, Michigan
DUNKIRK ENGINEERING COMPANY, Dunkirk, N. Y.
SEND FOR CATALOGUES.

It Would Pay You To Use Hartman's Pallets.

HARTMAN'S IMPROVED PALLET
PRESSED UP WITH PATENT DIES

The above cut represents my Improved Convex Brick Pallet, which is and must be superior to any other. It is concaved in center of sheet—the rise is, from leg to center of pallet, ⅜ of an inch, it strengthens the pallet, also makes a better appearance, and as the pallet is pressed up with patent dies on an 82-ton press it makes the pallet stiff, no springing. Also the edges on side of pallet are much stiffer and are not liable to crack all along the edge as when bent down by a break, which takes the life out of the pallet. These pallets are pressed up out of best refined and bloom flange iron, also annealed steel.

They are delivered to any one using them free on board in Philadelphia.

Regular Size Pallet: 34 in. by 12 in., 1 in. turned down, legs ⅛ by 1 in. and best strap iron with 3 rivet on top and 2 on side. Or any size made to order.

Plain, in bloom iron, Japanned, Galvanized, Leaded.

80 Thousand in Use. **80 Thousand in Use.**

GEORGE W. HARTMAN,

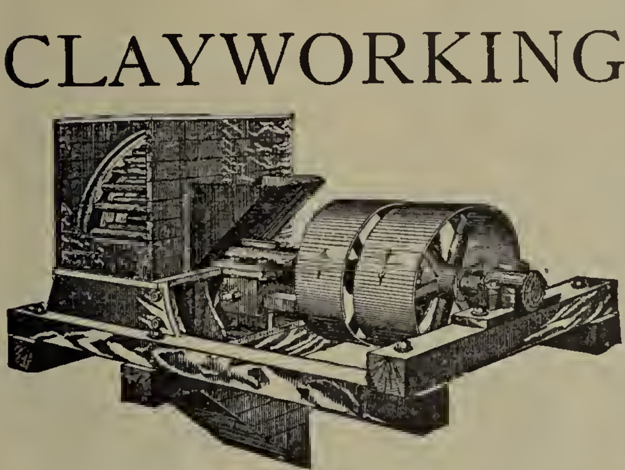
Tenth and Norris Street, PHILADELPHIA, PA.

Steam, Hot Air and Ventilating Works.

EAGLE MACHINE WORKS MFG. CO.,

MANUFACTURERS OF

CLAYWORKING MACHINERY.



The Lone Star Brick Machines, Eagle Pug Mills, Hercules Clay Rolls and Re-press Machines, Steel Moulds, Tile Mills, Etc. Pug Mills, Elevators and Engines.

Patent Pending Cyclone Pulverizer.

940 and 942 N. Main St. (Mention Clay-Worker.) ST. LOUIS, MO.

THE OLD AND THE NEW

Are strikingly contrasted in the illustrations, on preceding pages, of Independence Hall and the Philadelphia Broad Street Station, the latter being one of the best types of modern brick and terra cotta structures and the former is one of the oldest brick buildings in America.

THE ROUTE TO PHILADELPHIA.

The Baltimore & Ohio R. R. offers delegates to the National Brick Manufacturers' Convention the most attractive route to Philadelphia and at rates lower, from most western points, than can be obtained via any other through car line. Pullman's Palace Sleeping Cars are run through, without change to Philadelphia from Chicago, St. Louis and Cincinnati. In addition to the picturesque scenery along the line of the B. & O., all its trains between the East and West run via Washington. Congress will be in session during the time of the Brickmakers' Convention, and as many of the delegates will desire to visit the National Capital, either en route to or returning from the Convention, we would advise them to travel by the B. & O. R. R.

DENIES THE ALLEGATION.

Office of
ANTHONY ITTNER,
(Successor to Ittner Bros.)
BRICK MANUFACTURER.
Yard: California Avenue and Sidney St.

ST. LOUIS, MO., Nov. 9th, 1889.

NOTICE TO BRICK MANUFACTURERS.

Certain unscrupulous persons interested in the sale of brick machinery have falsely represented that I am pecuniarily interested in the sale of the Andrus Brick Press, four of which I use at my works in St. Louis.

I deem it due to the manufacturers of the Andrus Press to contradict such false statements, and I hereby state positively that neither myself nor my brothers have ever been interested or received one dollar's benefit from the sale of these machines. Our recommendations of the Andrus Press is due to its merit and the honorable course pursued by its manufacturers in the production and sale of a reliable first-class press brick machine. I use two of these machines to make my common pressed brick and during the past season two of these machines have produced ten millions of bricks.

I use one machine for ornamental and one for face or stock brick, producing all that are required both in quantity and quality.

The Andrus Machines at my works run with the regularity and precision of a good clock. They invariably make an even, pressed, perfect brick, unexcelled by any produced by any other machinery.

The Andrus Press is constructed upon the very best principles and I have found it to be all it is recommended to be by the manufacturers. ANTHONY ITTNER,
Successor to Ittner Bros.

FOR SALE, WANTED, ETC.

☞Advertising rates in this column 20 cents a line, or 3 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion.☜

FOR SALE. One set of Clay Rolls.
M. F. WILLIAMS & Co.,
10 tf d. 1417 N. 2nd St., St. Louis, Mo.

WANTED. A first-class tilemaker and burner.
GEO. HOERTY,
11 1 d. 2011 So. 3d Ave., Louisville, Ky.

FOR SALE. One Eureka Brick Machine and Clay Crusher at a bargain. Both in good running order.
NEWPORT & STEHENS,
11 tf d. Memphis, Tenn.

FOR SALE. One Andrus & Lefler 4-Mould Brick Machine, entirely new; for less than one-half price.
M. F. WILLIAMS & Co.,
11 1 d. St. Louis, Mo.

FOR SALE. One steampower sewer pipe press with dies from 3 to 24-in. Also cluster dies for tile from 3 to 7-in.
A. O. JONES & Co.,
9 tf. d. Columbus, O.

WANTED. A second-hand Dry Press Brick Machine, Andrus preferred. Address
DENVER FIRE CLAY CO.,
10 2 c. Denver, Col.

FOR SALE. One Chambers Brick Machine with engine and boiler complete. For particulars, apply to
J. D. SMALL,
10 5 p w. 1304 F St, N. W., Washington, D. C.

FOR SALE. Bennett Brick and Tile Machine, nearly new. No. 4 Penfield Brick and Tile Machine in good order. Four complete tempering wheels for steam power.
WM. E. HINCHLIFF,
11 tf d. Room 3, 159 La Salle St., Chicago, Ill.

WANTED. A partner in an established fire front and ornamental brick works in the vicinity of New York City. The location and natural advantages are such as to defy competition. Address Box 220,
8 3 d. Woodbridge, N. J.

FOR SALE. A well established brickyard conveniently located in Mobile, Ala., doing a good business. Reason for sale—to settle an estate. For full particulars, apply to A. M. QUIGLEY, Executor,
11 – d. Mobile, Ala.

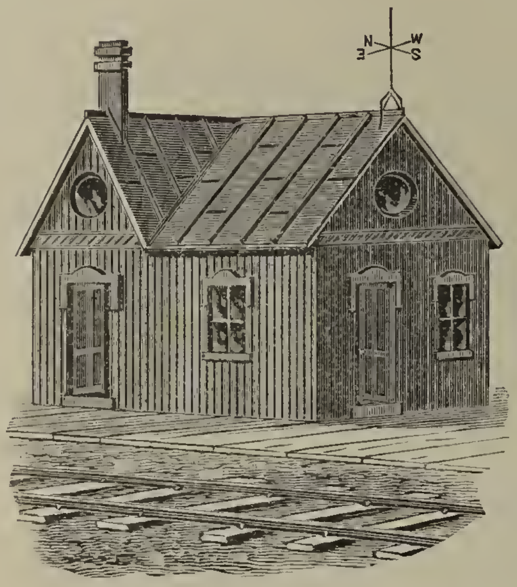
WANTED. Situation as Superintendent of brick works. 15 years practical experience in the manufacture of brick by dry press or stiff mud process and the building of kilns and burning same for common, paving or face brick. Address G. R.,
10 1 1p. Care Clay-Worker.

WANTED. Situation by a practical architectural modeler in clay, terra-cotta and plaster. Can make plaster moulds. Best references. Speaks French, German and English. Address "PLASTIC ART,"
Care Ch. Krengel, 160 Lubeck St.,
11 1 c. Chicago, Ill.

WANTED. Party in the West having a first-class tile factory and fine vein of fire clay, wishes a partner who understands making fire brick. A fine opening to right man who will assist in management. Capital required, $4,000. Address FIRE BRICK,
11 3 d. Care Clay-Worker.

FOR SALE. Three Wiles Standard Heavy Steam-power Brick Machines, complete. Also three Champion Brick Mould Sanding Machines, complete. Also sixteen open yard double spring mould trucks. All have been in use. Address CHAS. P. MERWIN,
Berlin Steam Brick Works,
11 tf d. Berlin, Conn.

THE CINCINNATI CORRUGATING CO.,

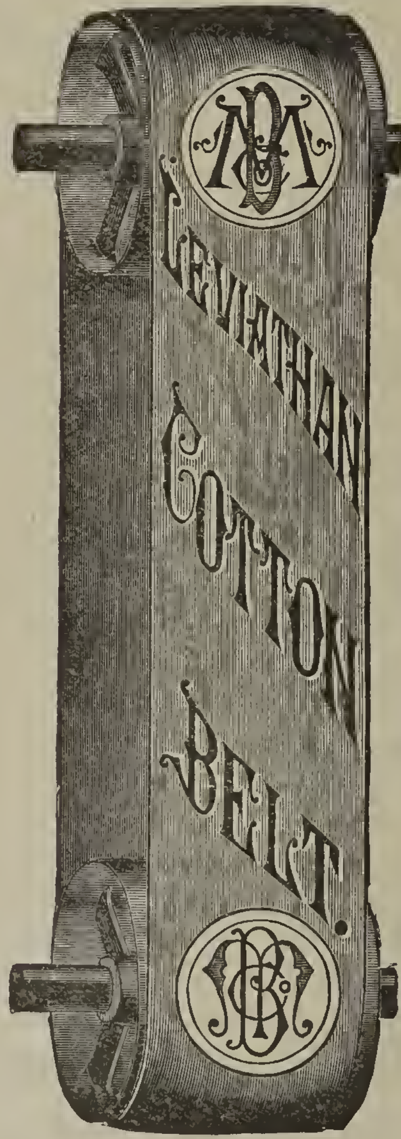


Manufacturers of Superior Iron and Steel Roofing, Patent Edge Corrugations, Ornamental Metallic Ceilings, Fireproof Arches, Corrugated Lath. All specially adapted for use in connection with Brick Yards, Kilns, Dry Houses, Etc.

As we control the manufacture of our Iron and Steel Sheets, we can guarantee unusually prompt delivery, and material of unequal quality.

THE CINCINNATI CORRUGATING CO.,

P. O. Box 219. **PIQUA, OHIO.**



SOLE MANUFACTURERS.

Main Belting Co.,

Manufacturers of the Celebrated

Leviathan Belting!

WHICH FOR

Strength and Traction Power

HAS NO EQUAL.

Specially adapted for Brick and Tile Machinery.

Unaffected by Heat, Steam or Dampness.

Send for Price List.
Samples sent on application.
Mention this paper.

FACTORY AT PHILADELPHIA.

Address,

Main Belting Co.,

248 Randolph Street, CHICAGO, ILLS.

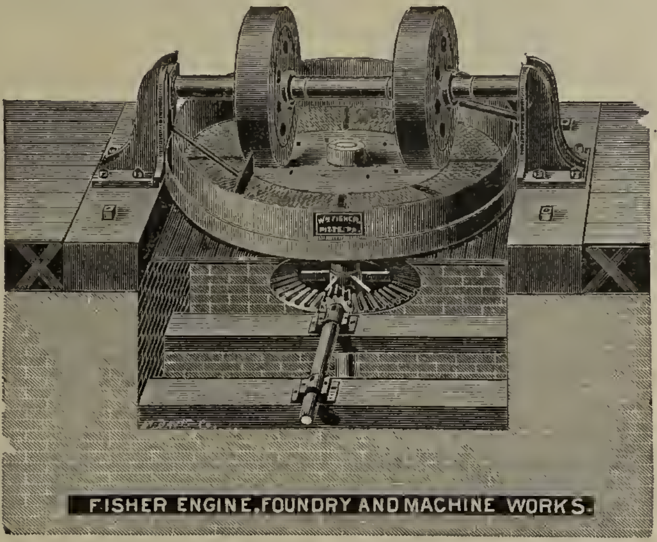
NOTE—To any responsible party sending us measures, we will ship a "Leviathan" Belt on sixty days trial; to be paid for if satisfactory.

SEE THE BATTLE OF ATLANTA.

Market St. Between Ills. St. and State House, Indianapolis.

STANDARD EIGHT-FOOT DRY GRINDING PAN.

For Fire Clay, Red Brick Clay, Limestone and Lime, Sand and Other Refractory Materials.


FISHER ENGINE, FOUNDRY AND MACHINE WORKS.

DESCRIPTION.

This Pan is undergeared and will grind Fire or Red Clay for 20,000 brick in 10 hours.

The Rolls weigh 5,000 lbs. each.

We make this Pan in different sizes, from 5 feet to 9 feet in diameter.

We also make them with iron frames or wood frames for overhead gear.

WE ALSO MANUFACTURE

Wet Grinding Pans from 5 to 12 ft. in diameter.
Stationary or Revolving Pans.
Glass House Pans.
Pug Mills with Iron Boxes.
Brick Presses. Press Boxes.
Brick Molds. Tile Presses. Engines. Gearing.
Blake Crushers and Special Machinery.

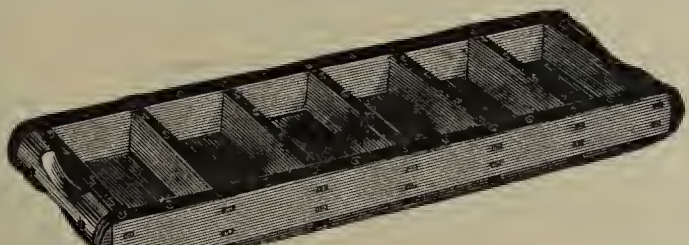
WM. FISHER, Proprietor,

23d, 24th and Smallman Sts., PITTSBURGH, PENN.

G. COLDEWE & CO.,

—MANUFACTURERS OF ALL KINDS AND SHAPES OF—

HAND AND MACHINE MOULDS.



We manufacture the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

:o:

☛Sample Moulds sent to any place in the United States free of charge. Send for Circular.

No. 829 Sixth Street, Milwaukee, Wis.

☛Mention the CLAY-WORKER.

ELEVATORS
FOR
CLAY, COAL,
ORES, SAND,
GRAIN,
ETC.

SECTION OF CONVEYOR.

ELEVATOR
FOR TILE,
BRICK,
PACKAGES, ETC.

Roller & Detachable

CHAIN BELTING,

Designed for

Elevators,

Conveyors,

Drive Belts,

—For Handling—

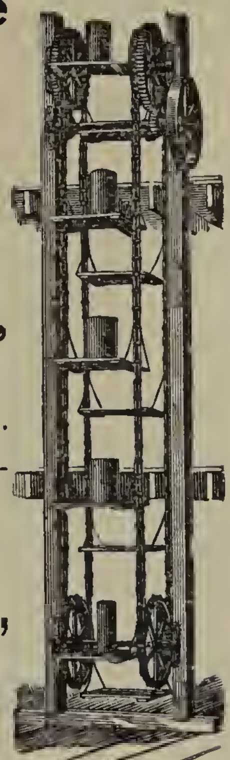
BRICK, CLAY, TILE, CLAY, ORES, ETC.

Estimates for handling material of any kind cheerfully furnished. For '88 Catalogue and prices

ADDRESS

The Jeffrey Manufacturing Co.,

112 East First Avenue,
COLUMBUS, - - OHIO.



FOS SALE. One Grand Automatic Brick Machine, eighteen to twenty thousand pallets and racks for same, all as good as new. The machine has only made about four hundred thousand brick. Will sell or exchange for some good Dry Press Machine. R. & D.,
11 1 c. 7428 Mich. Ave.. St. Louis, Mo.

FOR SALE. One New Departure Brick and Tile Machine with pallets and brick dies. One 50 h.p. engine, and boiler with pumps and line shaft belting; complete outfit. Also one Brewer-Tiffany Tile Mill and two roll crushers; one 15 h.p. engine and boiler with pumps, all in good order. B. F. TOWNSLEY,
9 tf d. Aledo, Ill.

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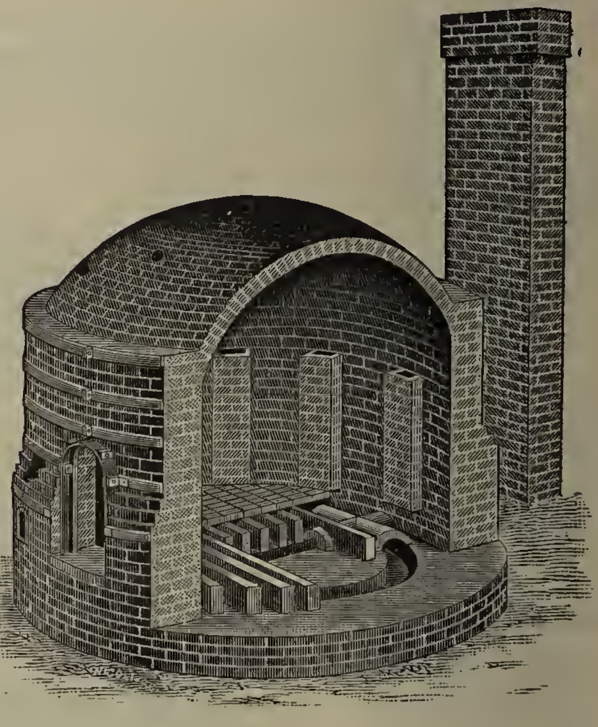

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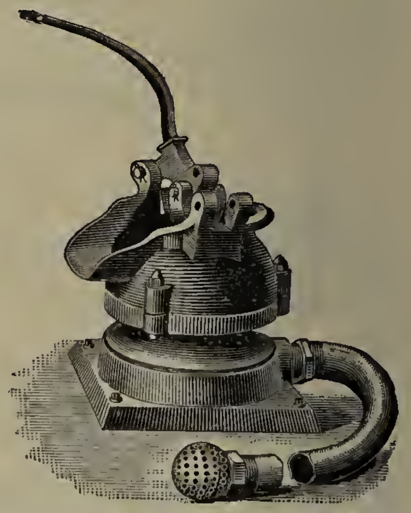

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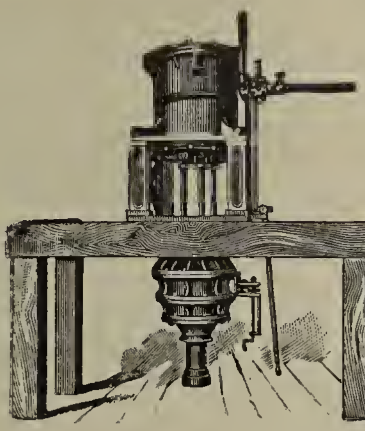

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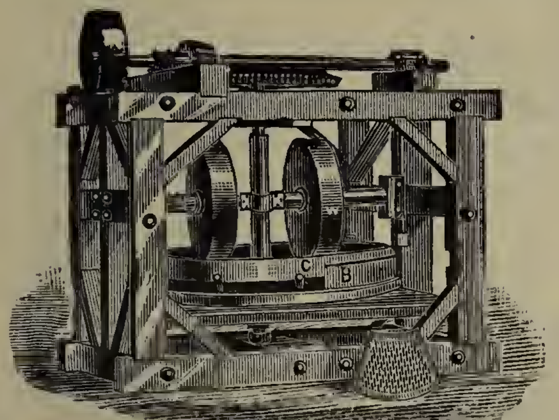

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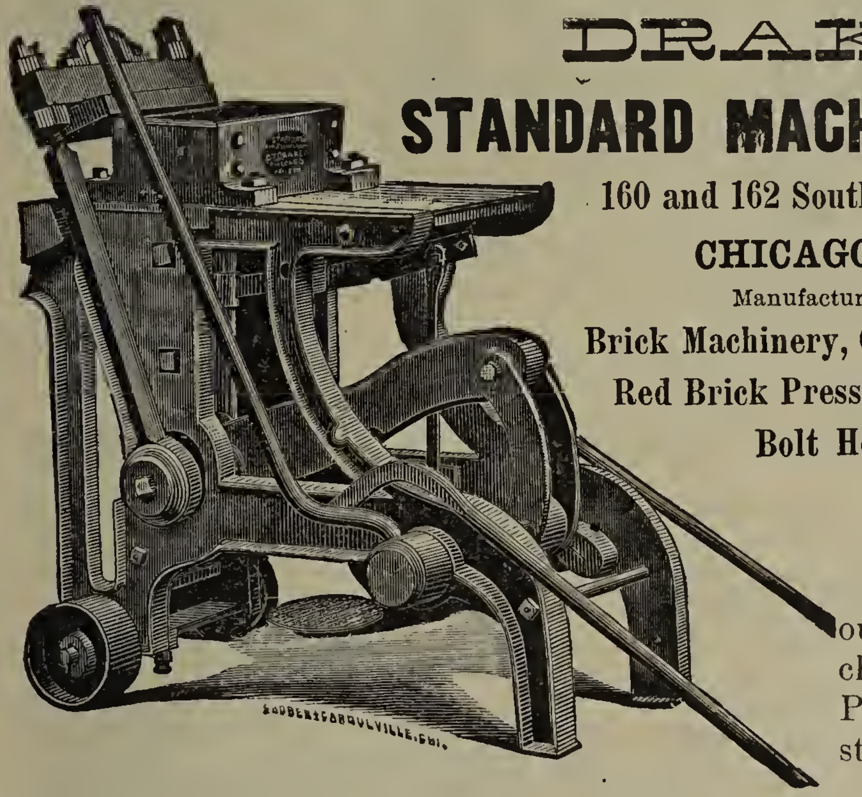

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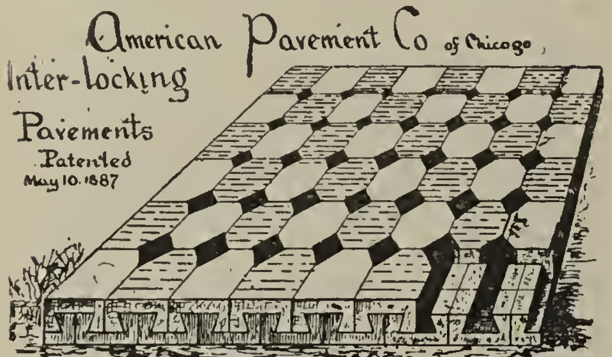

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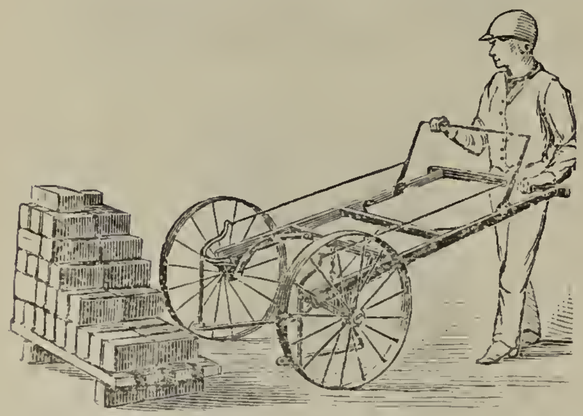

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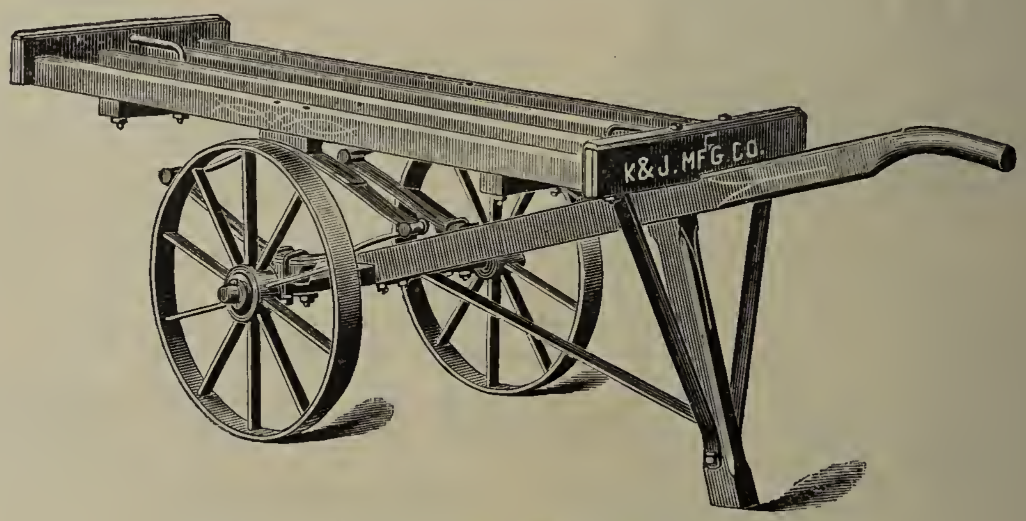

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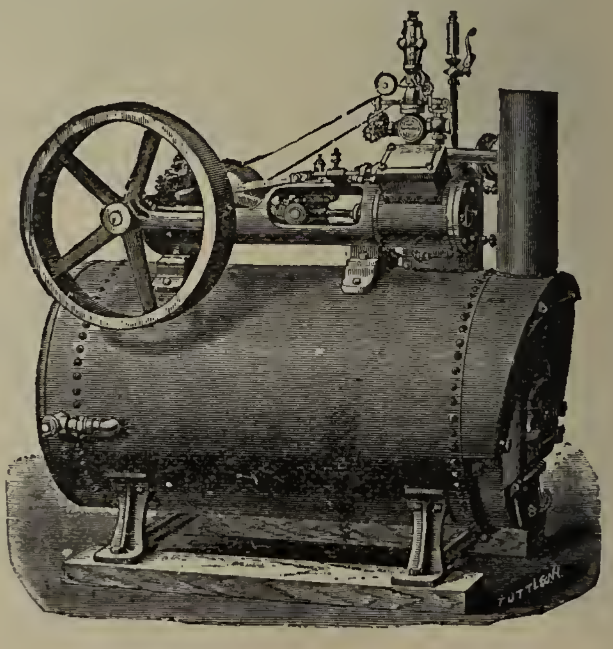

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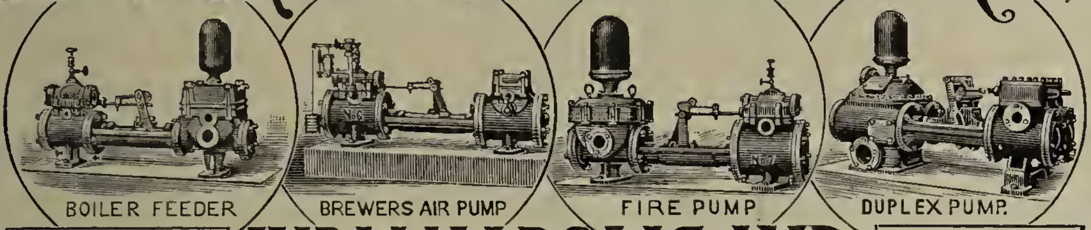

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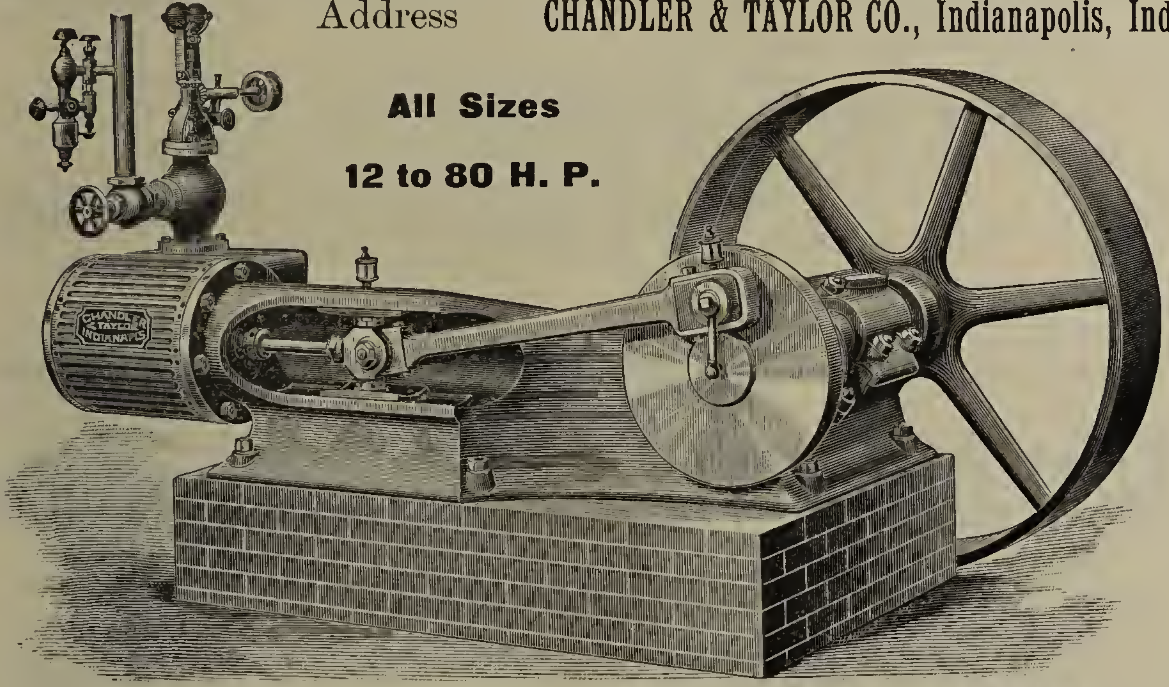

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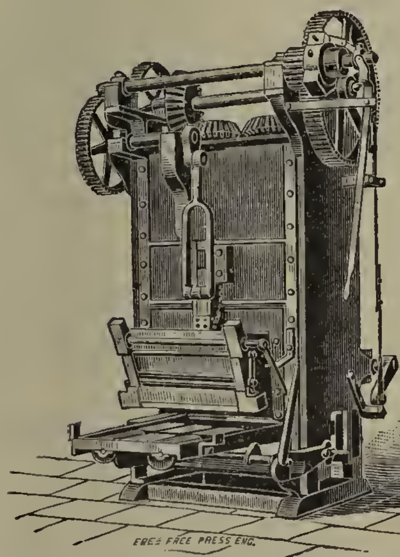

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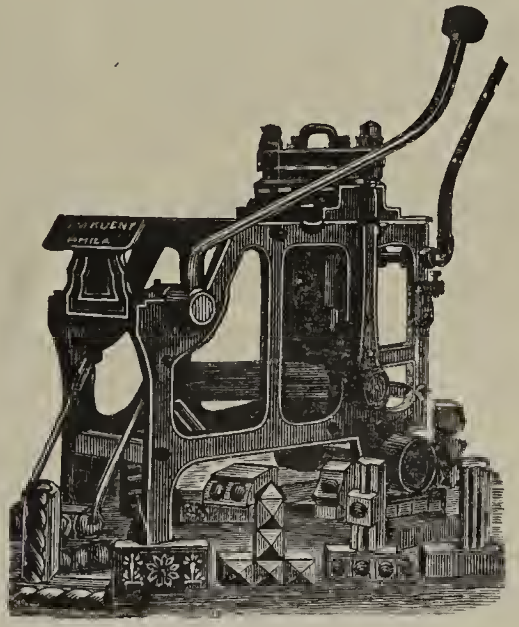

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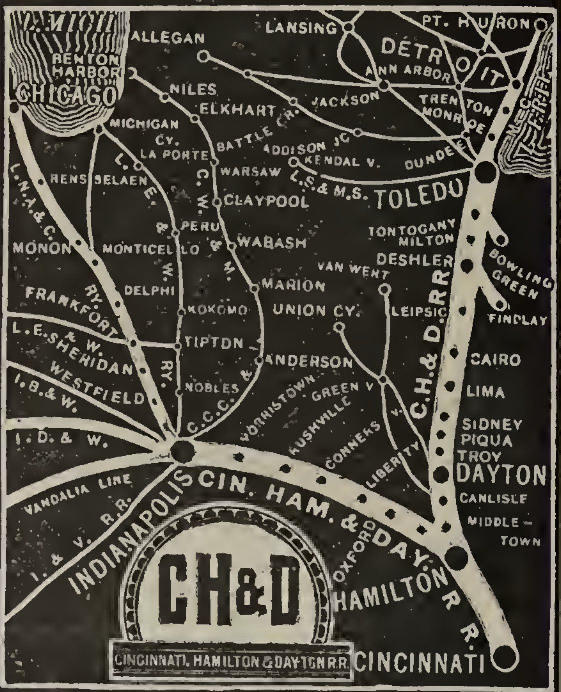

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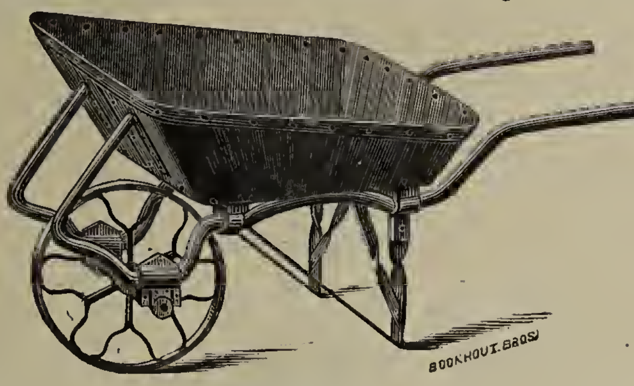

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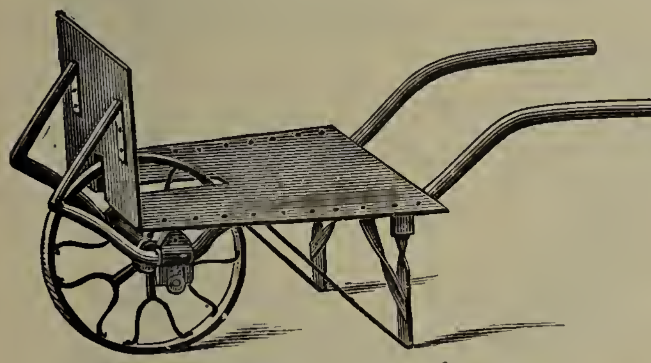

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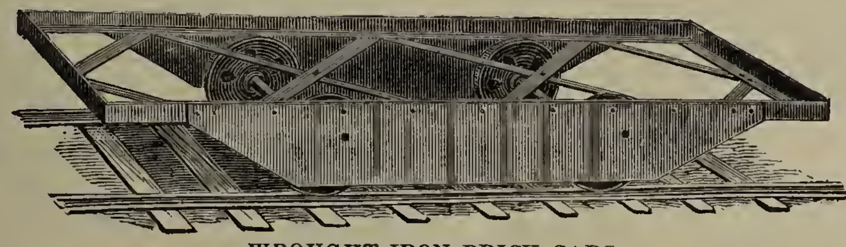

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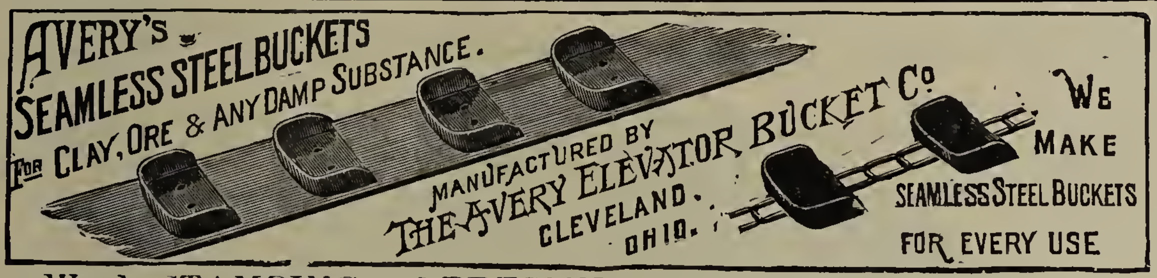

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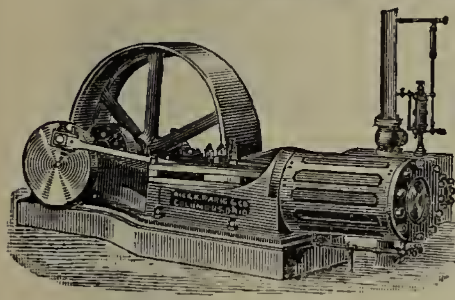

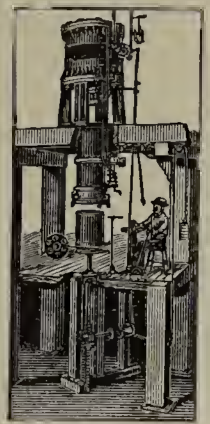

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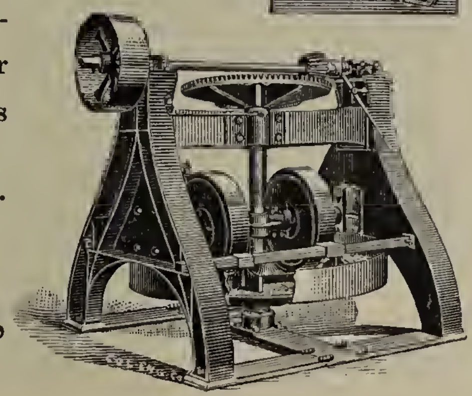

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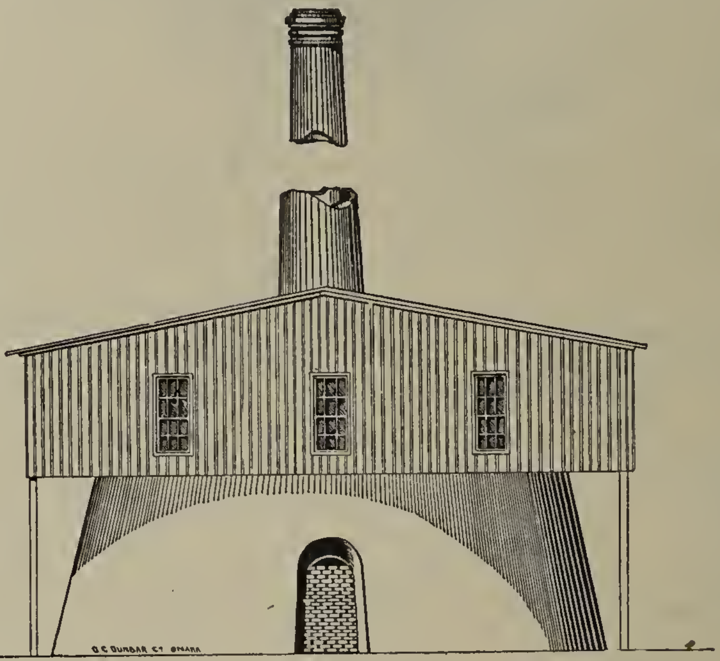

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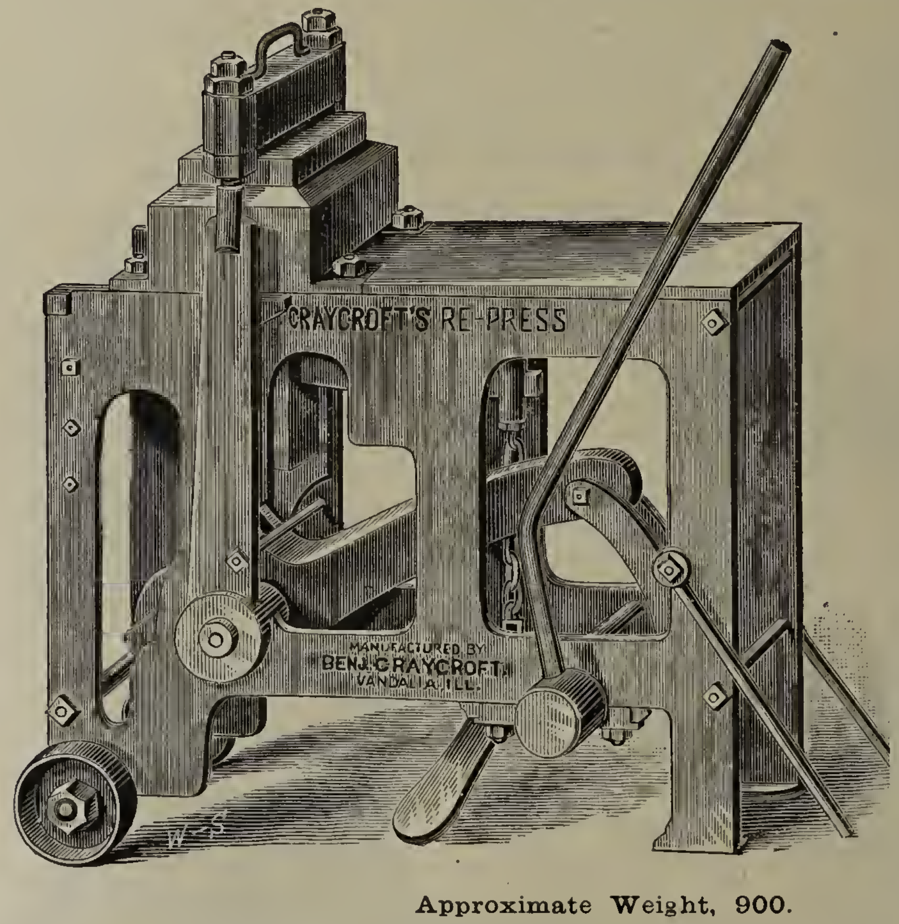

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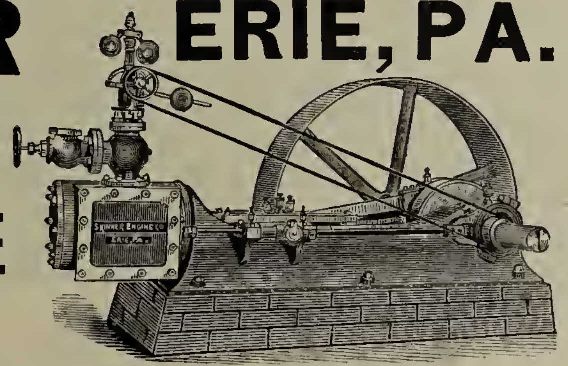

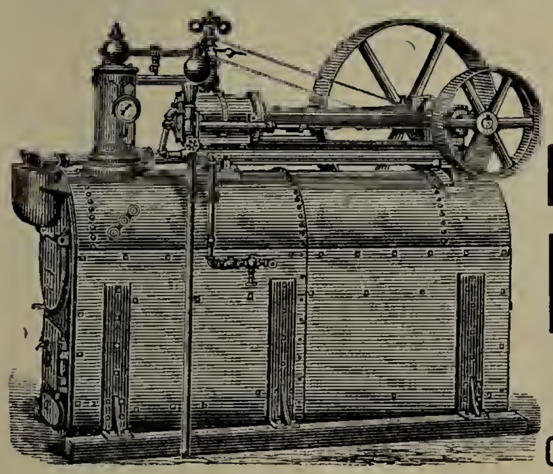

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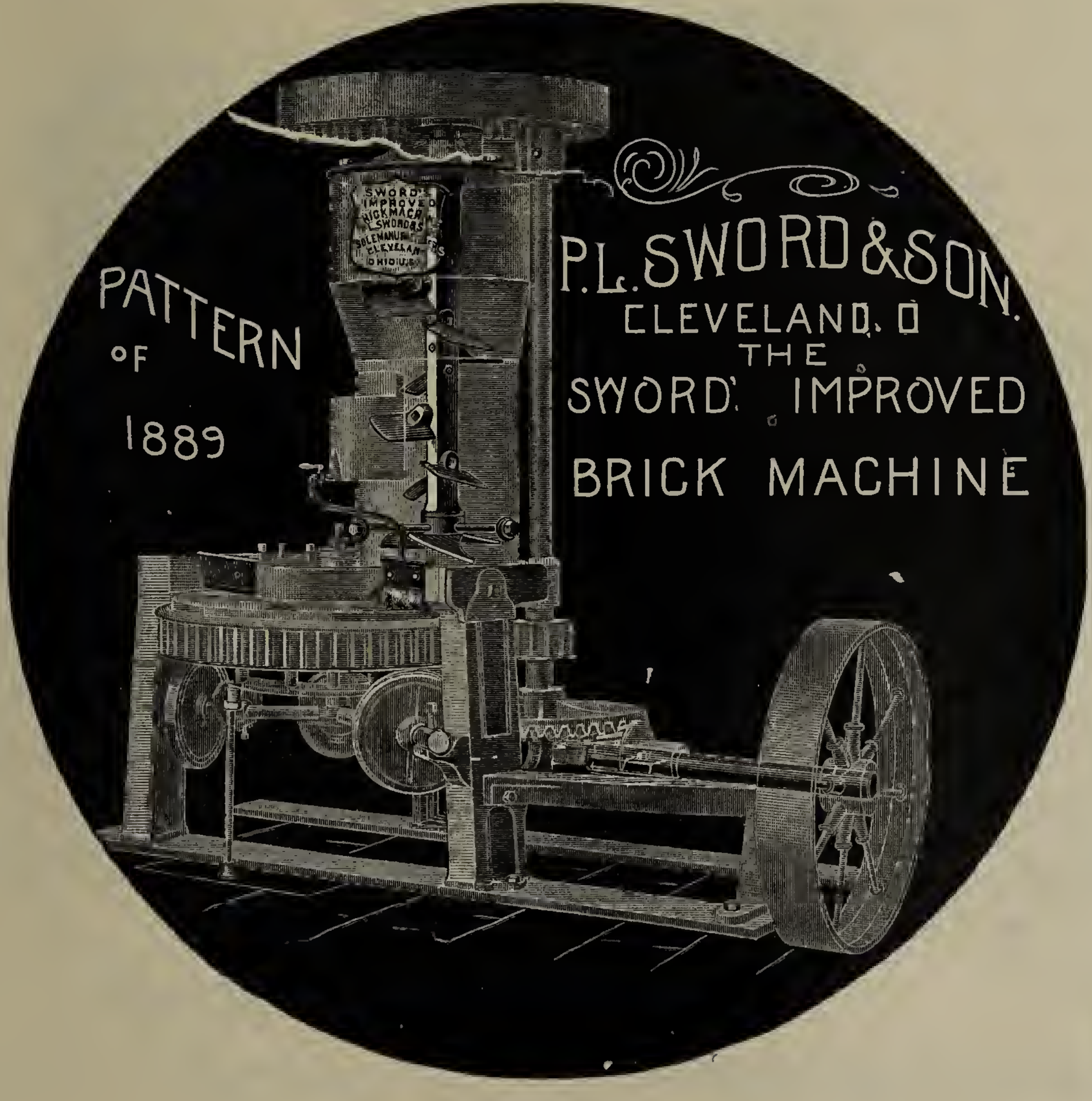

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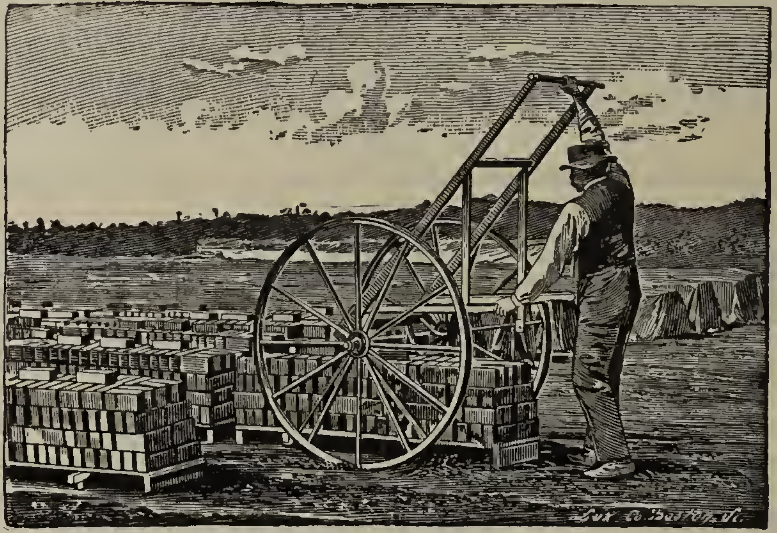

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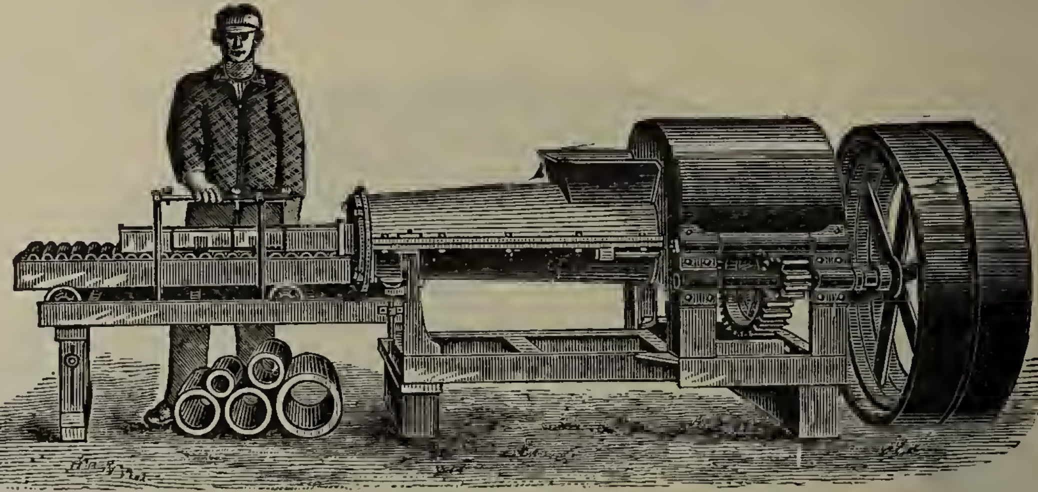

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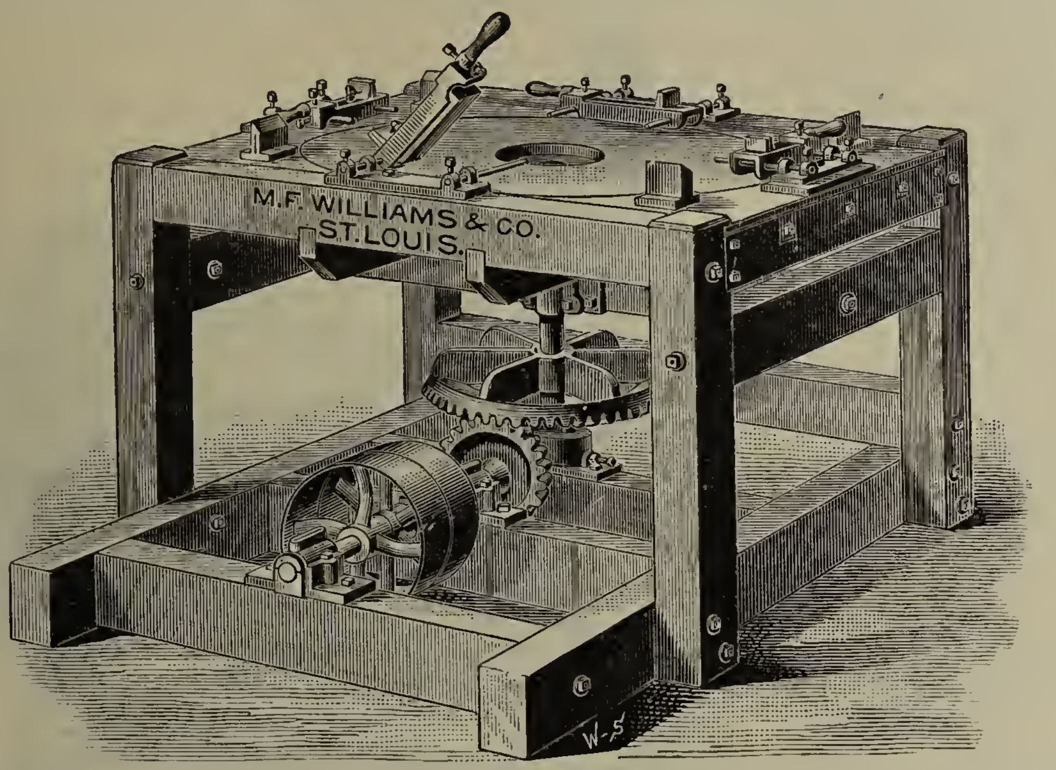
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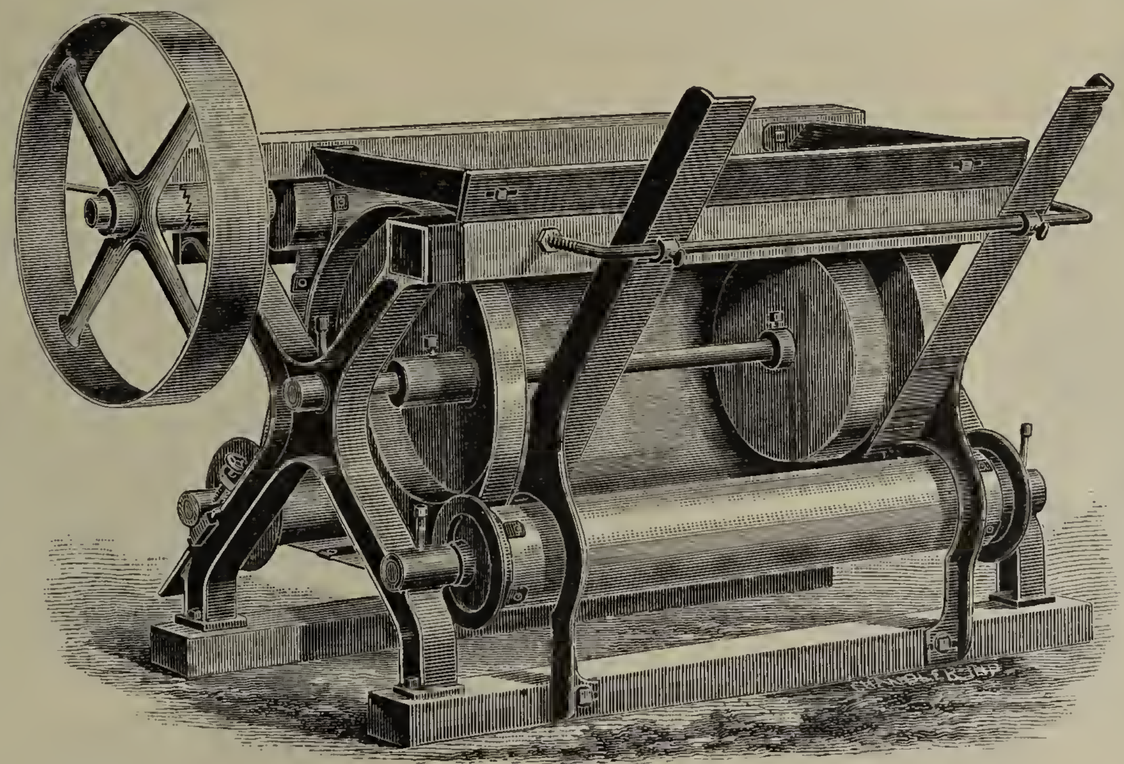

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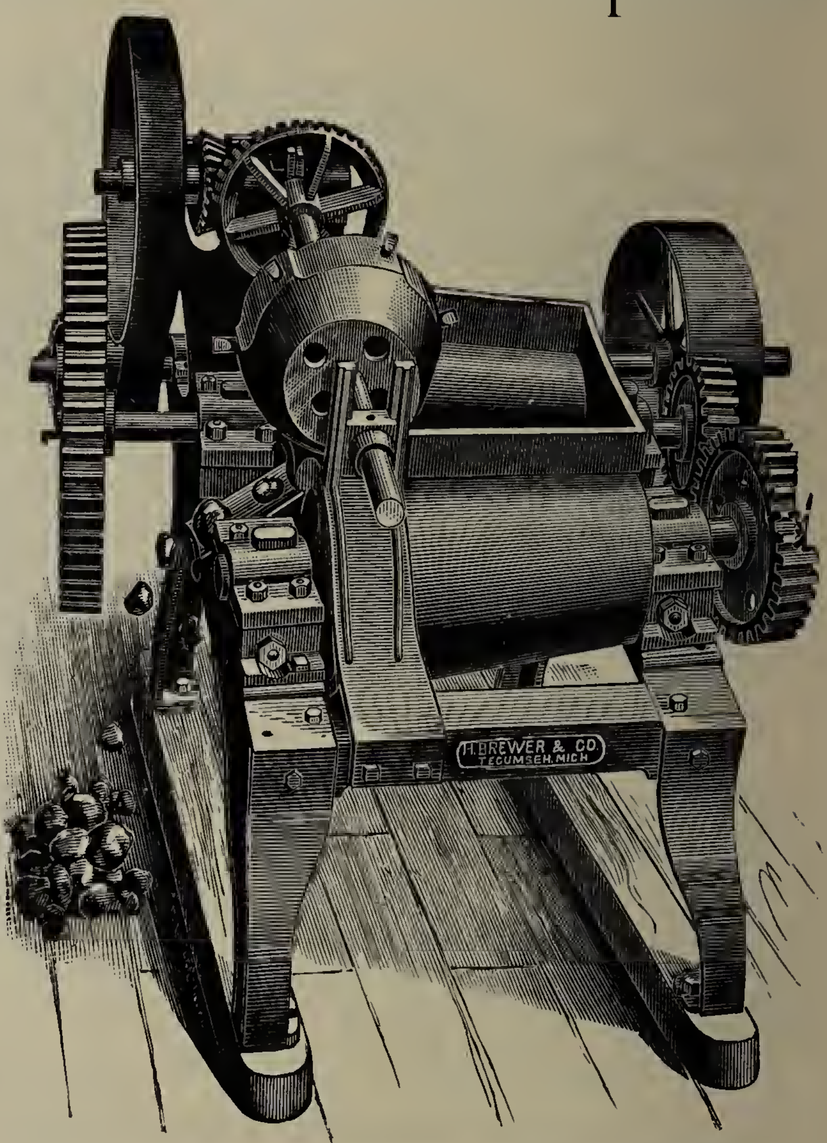

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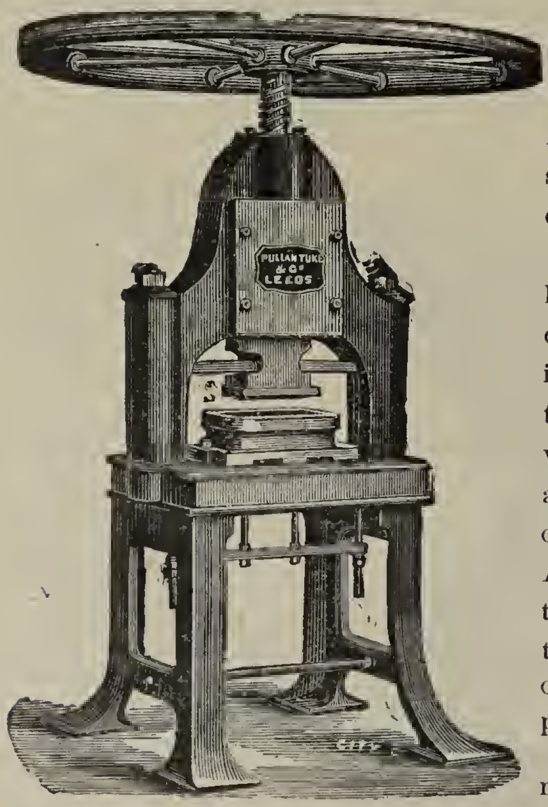

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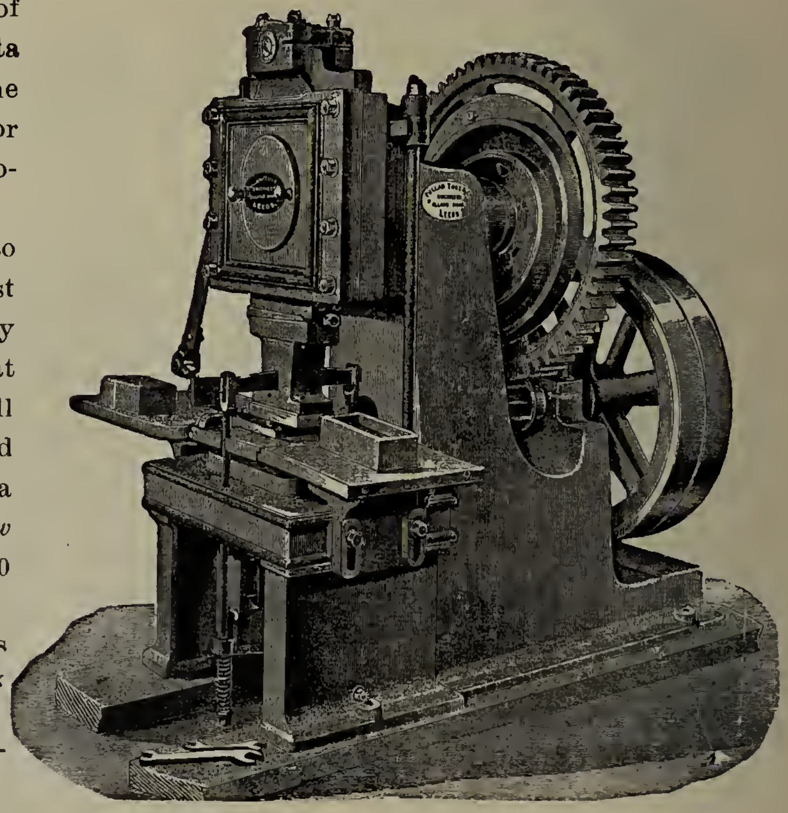

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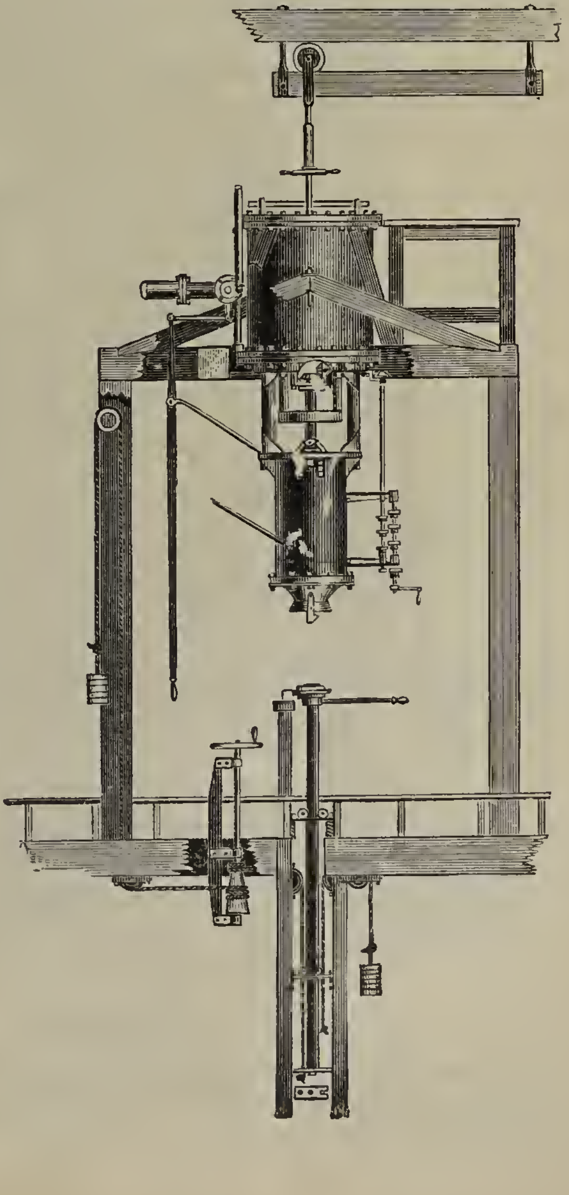

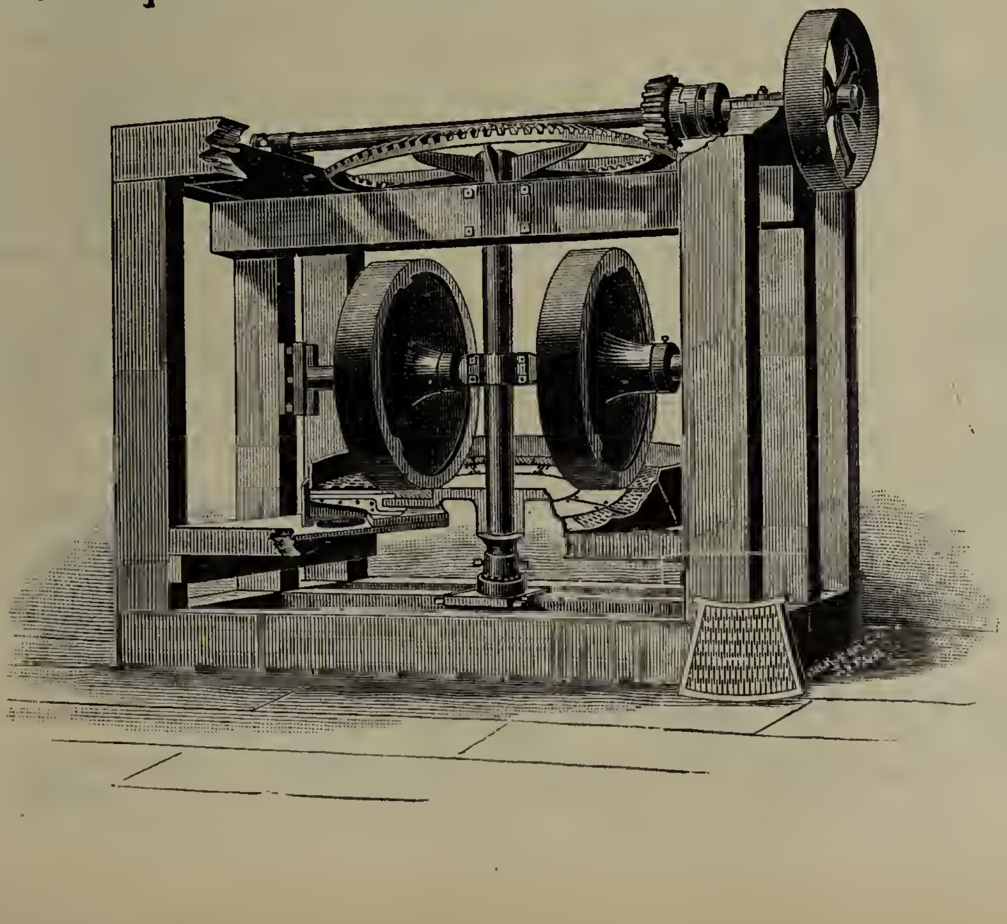

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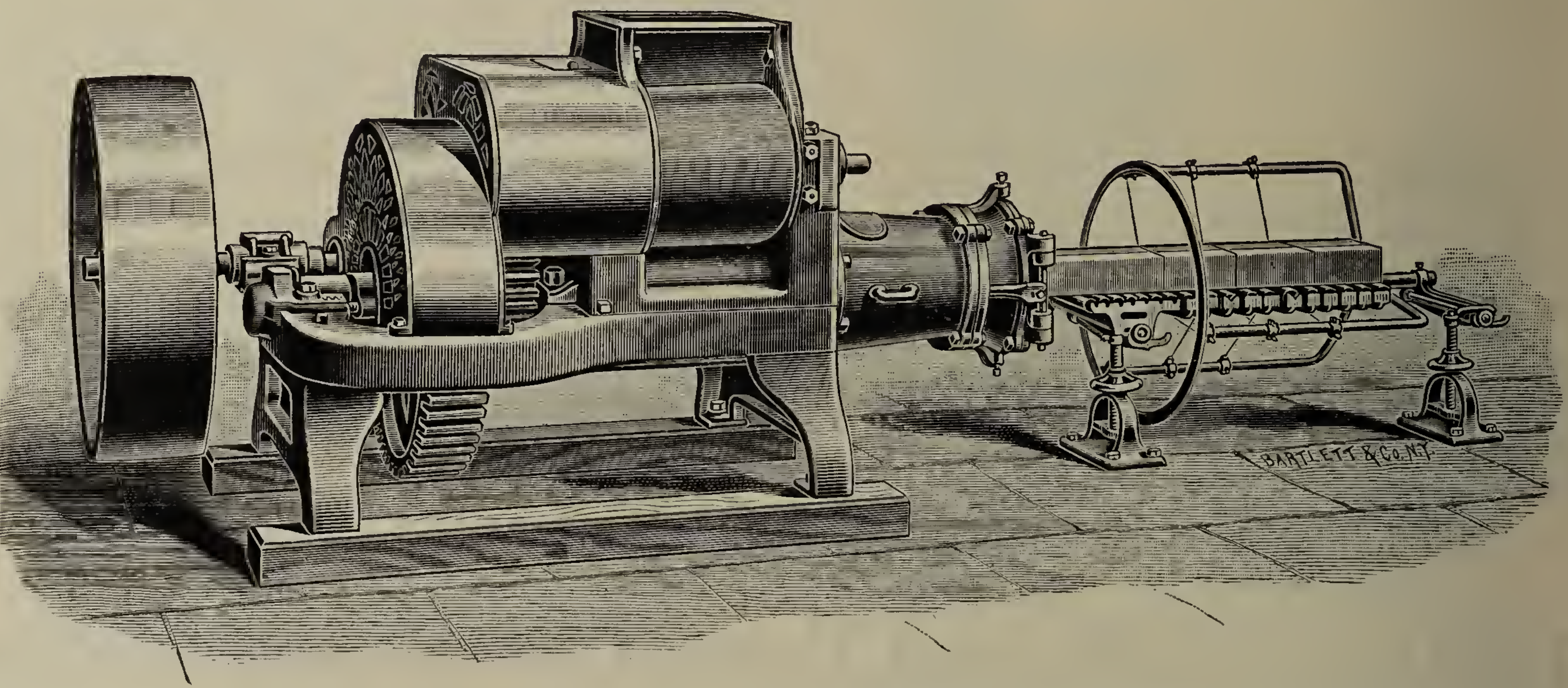
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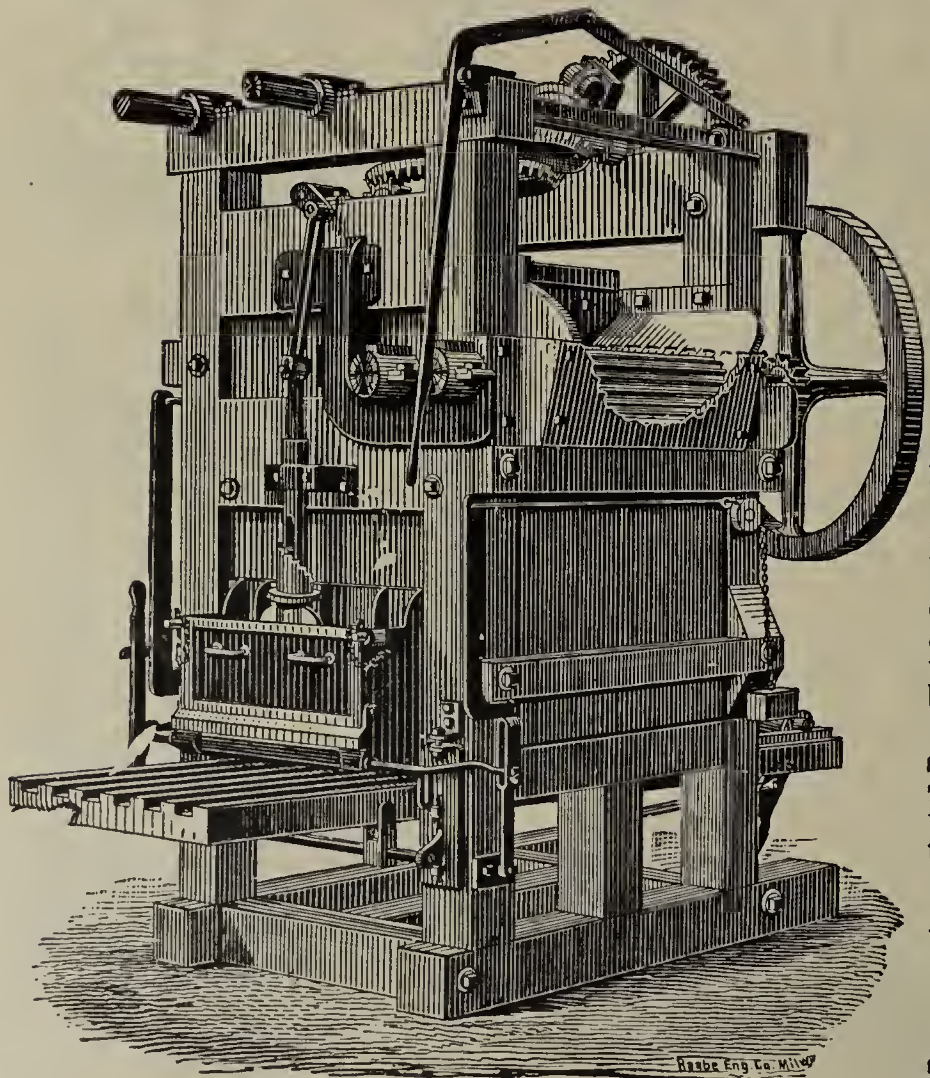

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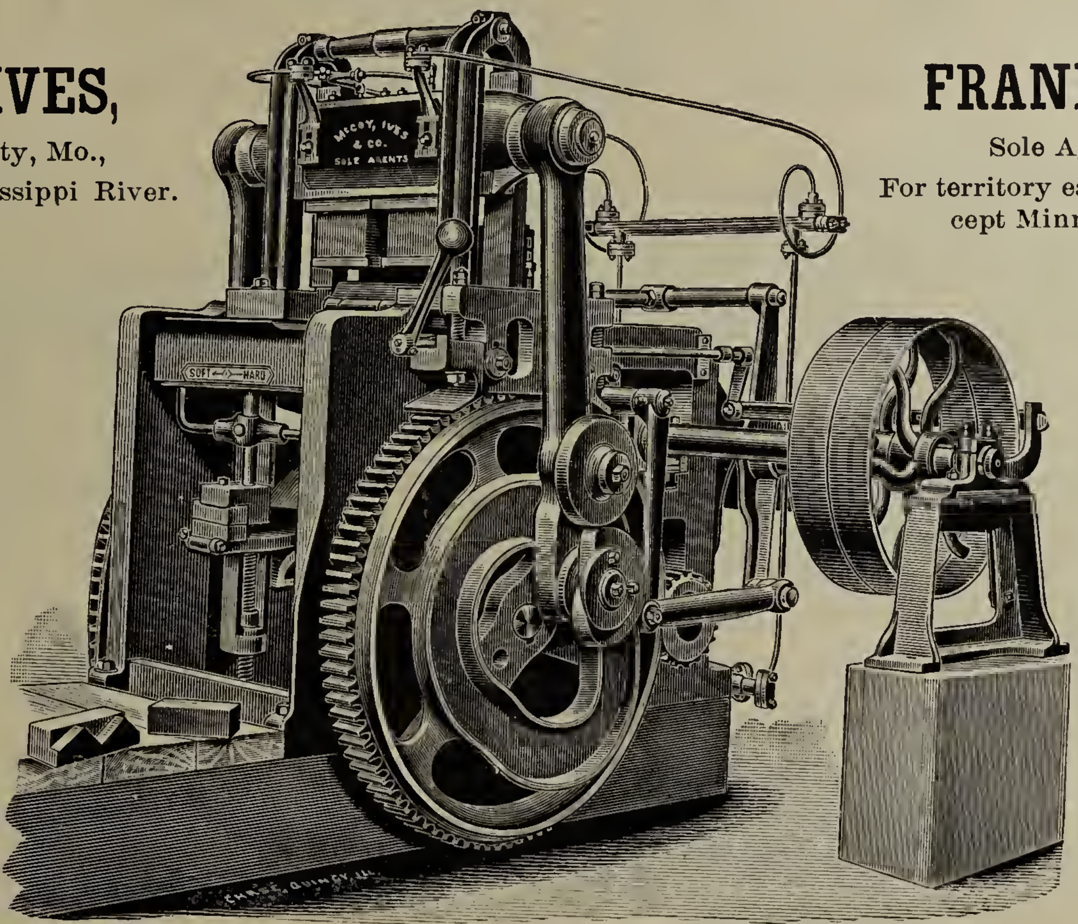
100 Wisconsin St., MILWAUKEE, WIS.

WHITTAKER'S CELEBRATED SEMI-DRY BRICK MACHINE

[Patented in U. S. May 13, 1884.]

T. DWIGHT IVES,
Sole Agent, Kansas City, Mo.,
For territory west of Mississippi River.

FRANK D. BROWN,
Sole Agent, Quincy, Ills.,
For territory east of Mississippi River, except Minnesota and Wisconsin.

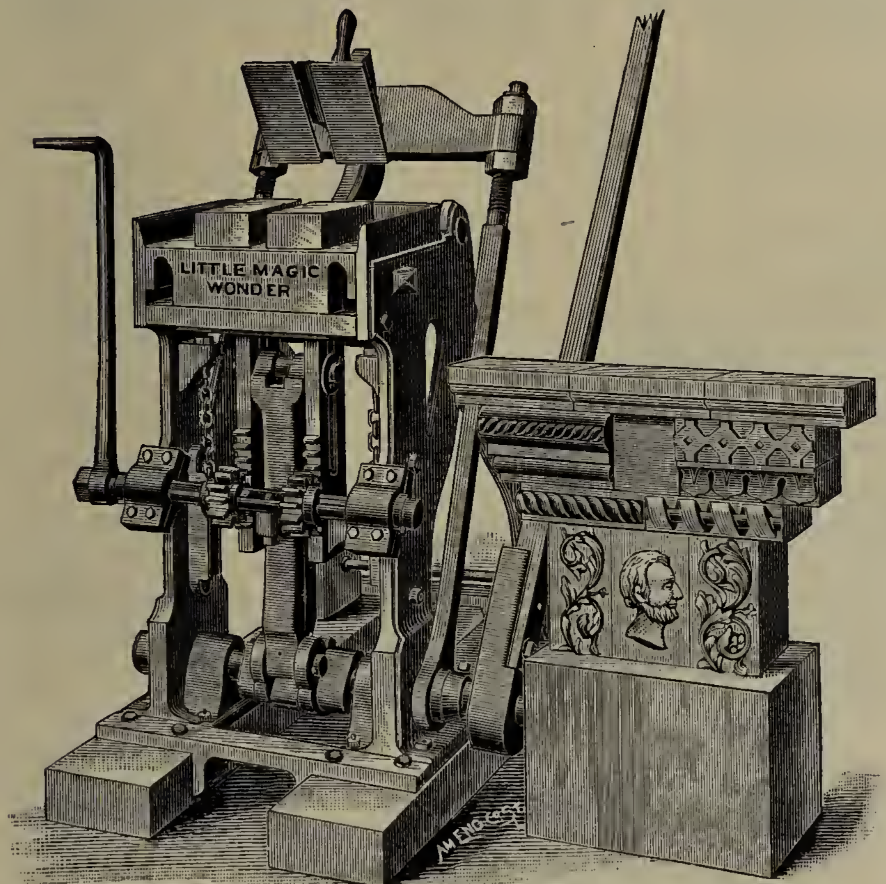

McCOY, IVES & CO. SOLE AGENTS
SOFT HARD

THE ONLY PERFECT BRICK MACHINE MADE.

The LITTLE MAGIC WONDER

It Will Do It!

Over 1,000 Different Patterns of Ornamental Bricks Can Be Made on this Wonderful Press.



Hear What a Prominent Brickmaker Says:

St. Louis, Feb. 3d, 1889.

Mr. Wm. Thaison, Austin, Texas:

Dear Sir—At the end of a fair and satisfactory trial of your Little Magic Wonder Dry Clay Hand Brick Press, it affords me great pleasure to testify to its efficiency for the purpose intended. I had long been looking for just such a Press, whereon at short notice and at very slight expense we could, within a few hours' time get out small orders for ornamental bricks of special designs and patterns without interfering with the operation and working of our regular machines. The great value of your Hand Press to me, lies in the fact that we can make bricks upon it by pressure on edge as well as flat wise, thus enabling one to make almost any conceivable design of fancy moulded ornamental bricks. As you let your machines go out on trial there can come no loss to parties intending to purchase.

Very Respectfully, Anthony Ittner.

Mr. Ittner runs two of these machines. His reputation as a gentleman and an expert brickmaker is so well and favorably known to the readers of the Clay-Worker that further comment is unnecessary.

☛For further particulars and circulars address

Lone Star Brick Machine Mfg. Co,
AUSTIN, TEXAS.

Mention the Clay-Worker.]

THE STANDARD BRICK MACHINES

—MANUFACTURED BY—

A. M. & W. H. WILES,

Grassy Point, Rockland County, New York.

These Moulding Machines have been in constant use for over 30 years, and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.

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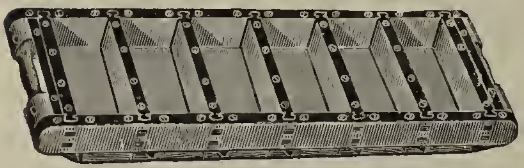
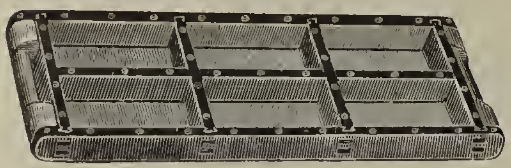
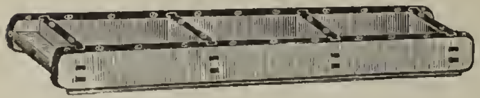
6 B. MACHINE MOULD.



6 B. HAND MOULD.



3 B. HAND MOULD.



D. J. C. ARNOLD,

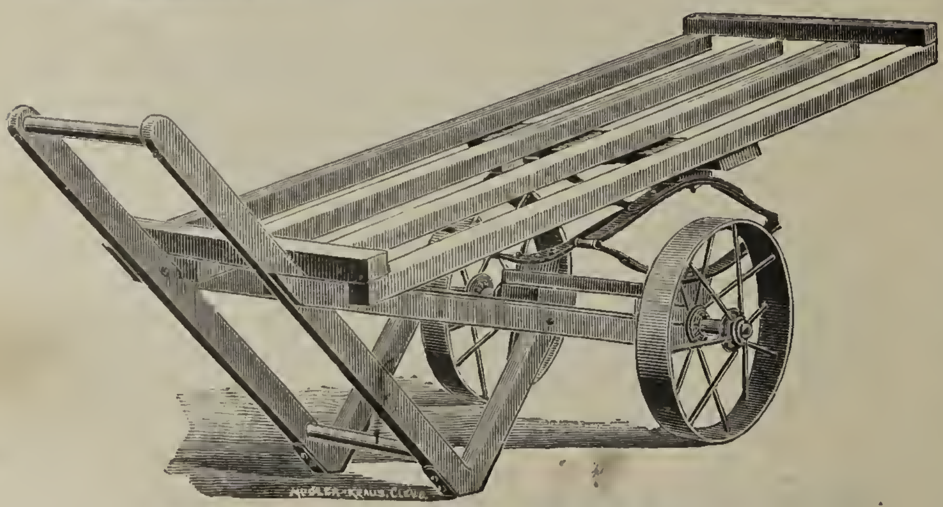
MAKES ∴ BRICK ∴ YARD ∴ SUPPLIES

At NEW LONDON, OHIO.

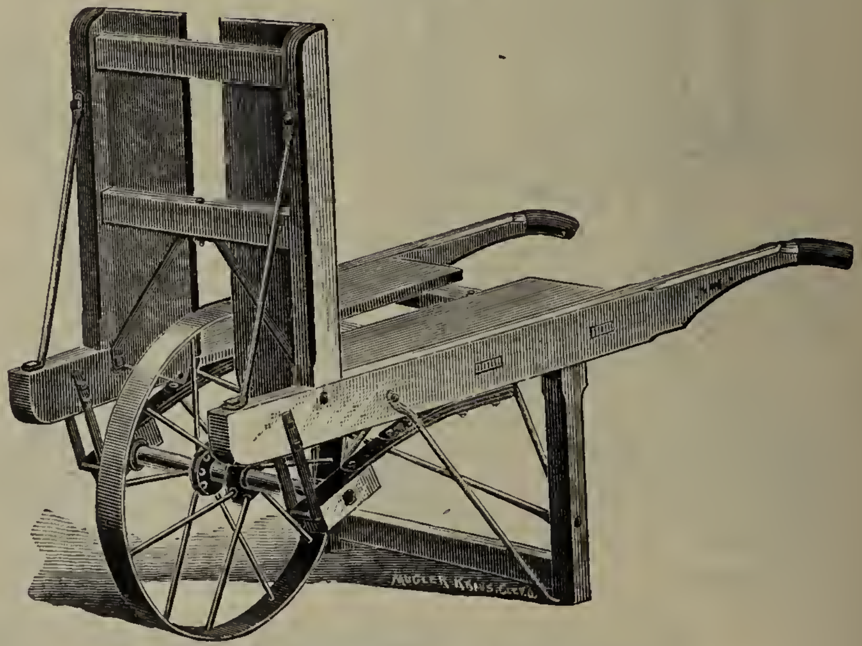
Get his prices before you buy. All goods first-class in every respect.

[Mention the Clay-Worker.]

☞Catalogue sent on application.


MUGLER-KRAUS, CLEVE.

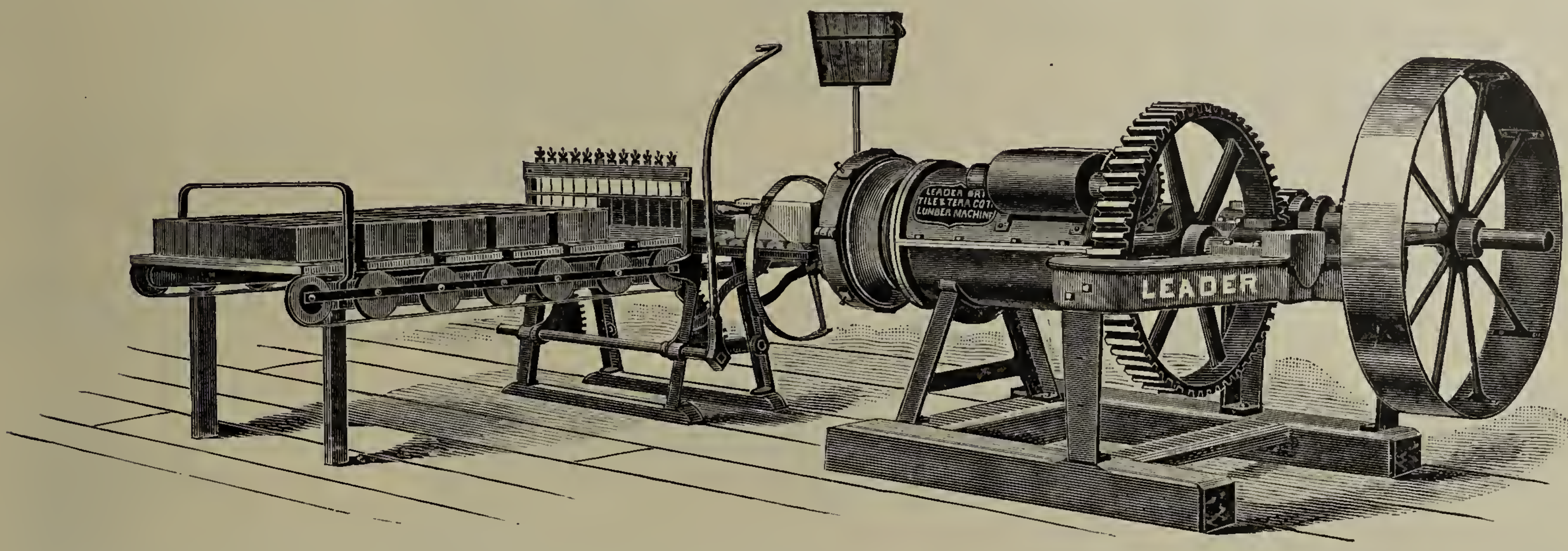
NO. 10 SPRING TRUCK.
(Weight 100 pounds.)


MUGLER KRAUS, CLEVE.

NO. 1 BRICK BARROW.
(Weight with springs 100 lbs.)

THE LEADER BRICK MACHINE.

WITH SELF DELIVERY TABLE AND LUBRICATING DIE.


LEADER BRICK TILE & TERRA COTTA LUMBER MACHINE
LEADER

We manufacture the latest and most approved designs of machinery for making Brick and Tile. Also a complete line of Clay-working Machinery, Clay Crushers, Elevators, Dump Cars, etc.

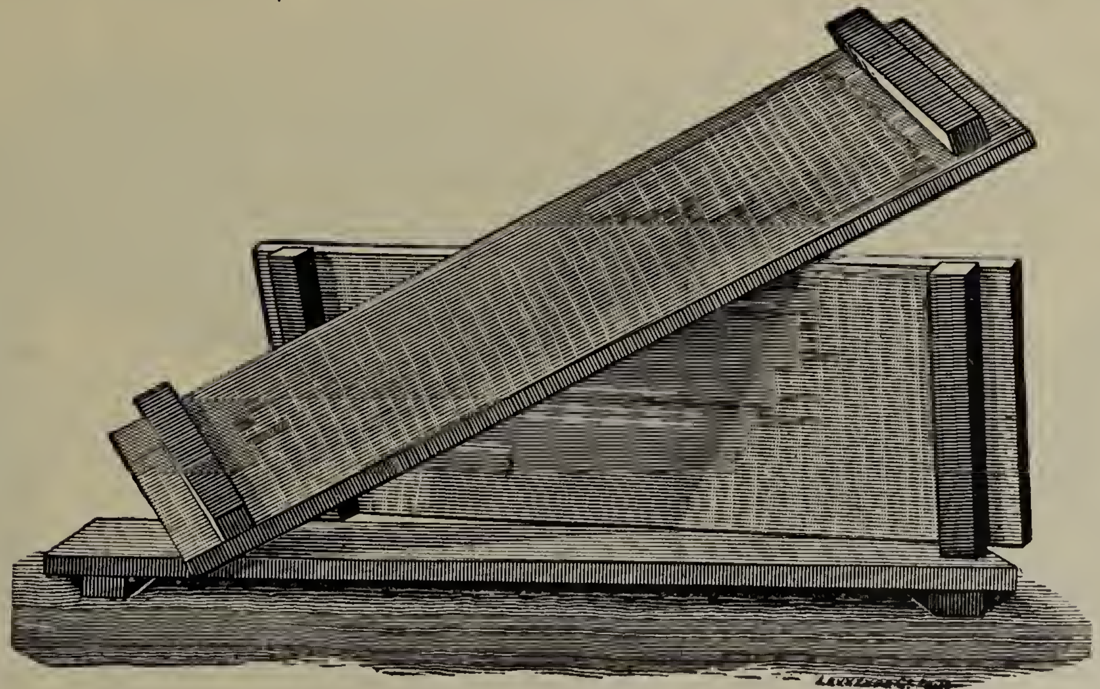
Circulars free. Correspondence solicited.

BROWN & HARROP MFG. CO.,

Mention Clay-Worker.] PORTLAND, IND.

BRICK PALLETS.

Brick Pallets.



Brick Pallets.

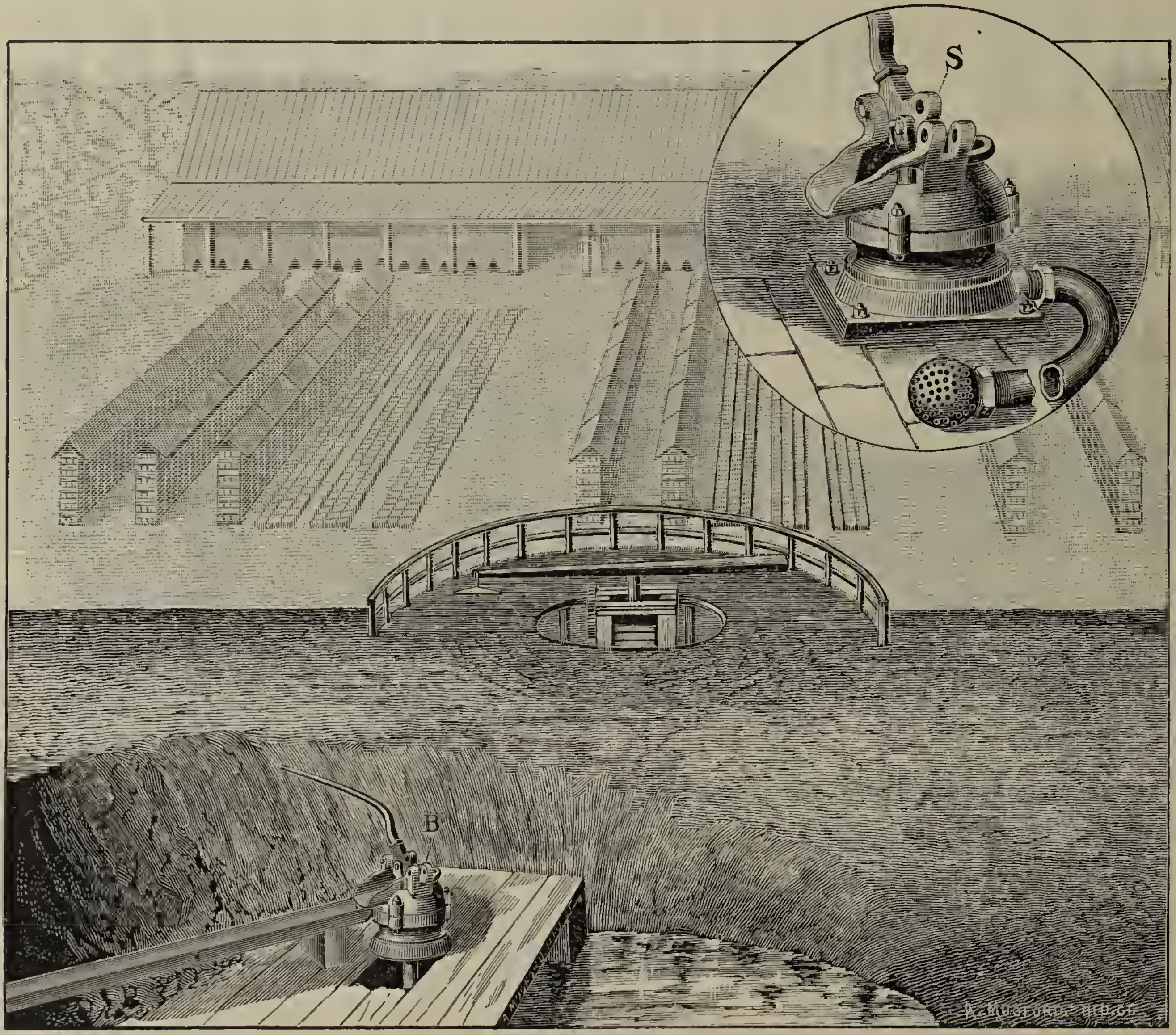
PIPE BOARDS, ROOFING LUMBER Supplied Direct in Carload Lots.

When writing for prices, give an exact description of the kind of pallet wanted, as different pallets are in use in different sections of the country. State whether cleats are to be nailed on; also length, width and thickness of the pallet. We have a big trade in this line and can save you one profit. Write for prices.

W. B. MERSHON & CO.,

Manufacturers of all kinds of white pine lumber and packing boxes in shooks.

East Saginaw, Mich.



A large capacity Pump for Brickyard use.

Will pump water containing sand, gravel, mud, etc., without perceptible wear.

Capacity, 3,500 to 4,000 gallons of water per hour by hand ower.

These pumps will be sent on 30 day's trial to responsible brick makers.

Every brickyard should have one of the large capacity hand pumps for emergency.

Price of pump for Side Suction Connections marked in cut S, $26.00.

Price of pump for Bottom Suction Connections marked in cut B, $24.00.

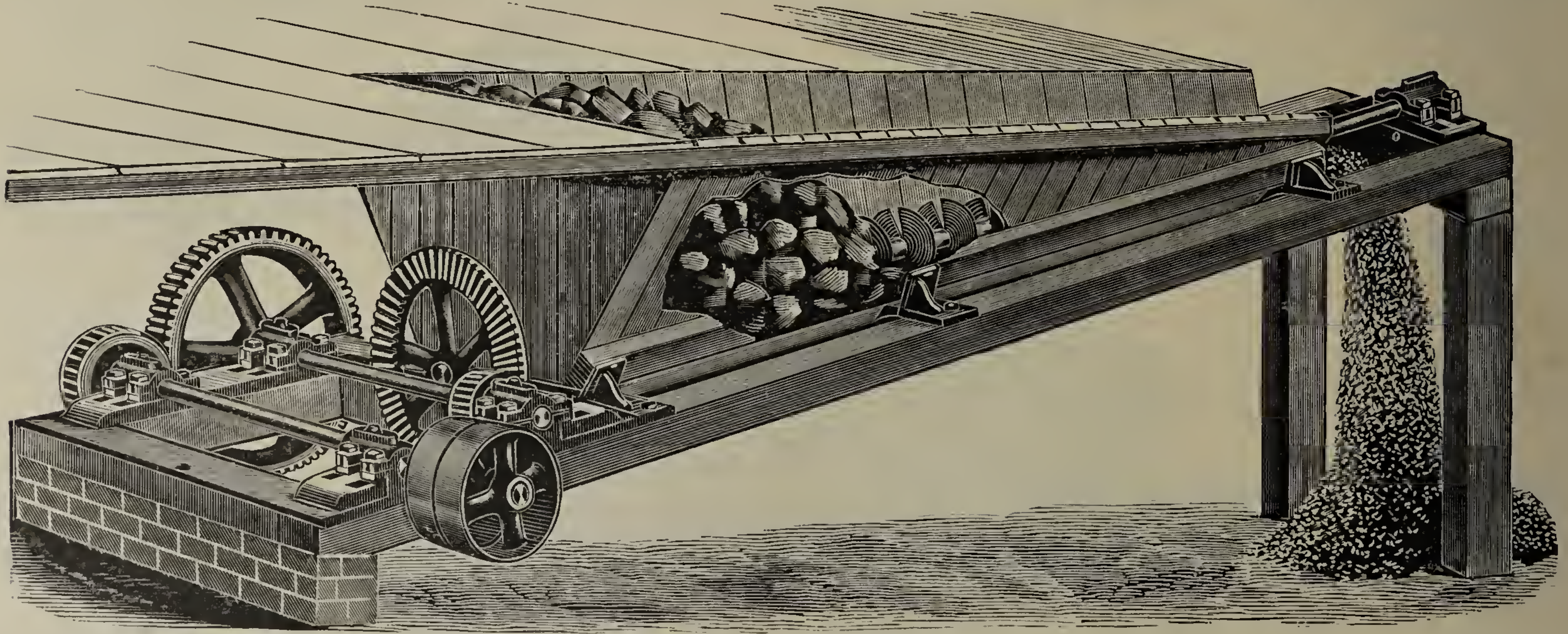
A discount of 15 per cent. will be made from the above prices for the next 60 days.

These pumps are constructed under the supervision of the Inventor,

Geo. D. Loud,
BOSTON, MASS
Room 78 Mason Bld'g.

Emen's Patent Perfection Clay Granulator and Feeder.

SOLD SUBJECT TO TRIAL AND APPROVAL.



Saves time and labor and produces better ware; simple in construction; rapid and accurate in operation. Every brick, tile and sewer pipe manufacturer should investigate the merits of this machine.

During the past season it was introduced in several of the leading Chicago brickyards and is now at work giving entire satisfaction. Write for descriptive circulars.

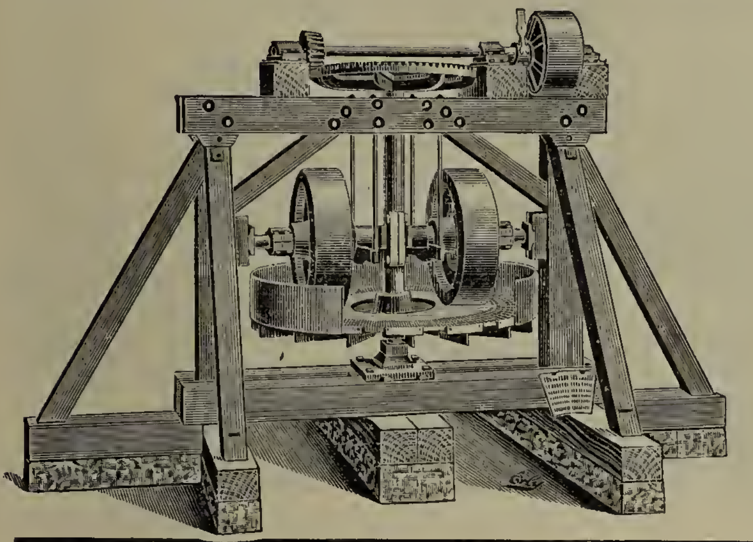
Chambers Brothers Company, of Philadelphia, Pa., are licensed to manufacture and sell these machines.

EMENS AND COLE

[Mention Clay-Worker.]

HOLTON, (MUSKEGON CO.) MICH.

THE FROST
Dry & Wet-Pan Crushers, Chasers, Etc.,



—FOR—

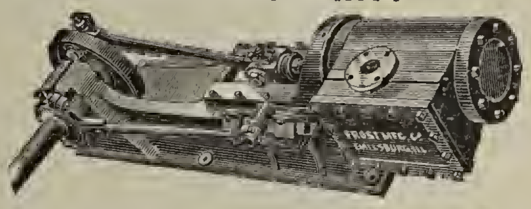
BRICK, TERRA-COTTA, SEWER PIPE AND FIRE CLAY.

—o—

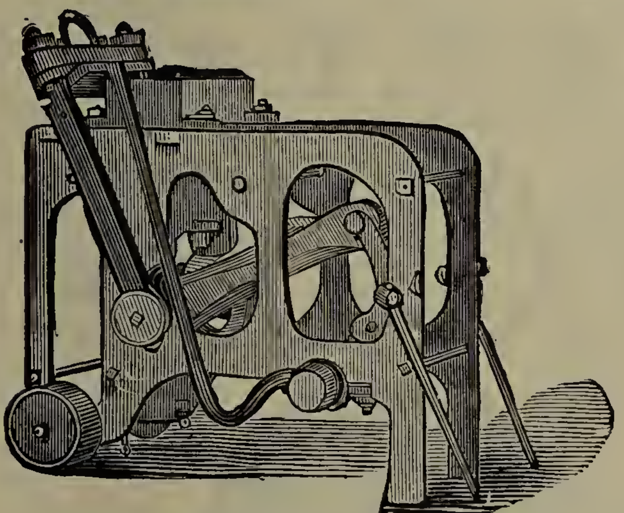
The best and cheapest machines made for working hard clay, soap stone, grog, etc.

Write for prices and other intromation.

THE FROST ENGINE CO.
GALESBURG, ILL.
ALL SIZES UP TO 150 H.P.



ELEVATOR SUPPLIES
PULLEYS, SHAFTING, SPROCKETS, BUCKETS, BELTING, SHELLERS, CLEANERS, MILLS: &C.
SEND FOR CATALOGUES



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1819 and 1821 Germantown Avenue, and Fifth St.,
PHILADELPHIA, PA.

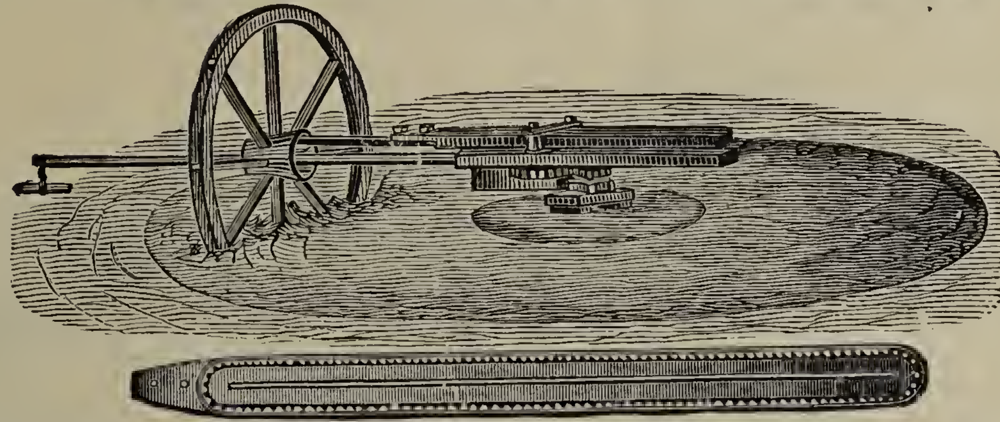
☞**Send for Circular and Price-List.**

Philadelphia Brick Machine Works

—MANUFACTURER OF—

FIRE AND RED BRICK PRESSES.

Various sizes, from the smallest size up to 14 inches; also, manufacturer of **Clay Mills, Tempering Machinery,** and all kinds of **Brickmakers' Tools.**



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and is fitted up ten per cent. cheaper. ☞Mention THE CLAY WORKER.

ESTABLISHED 1812,
AND CONTINUED ON THE SAME PREMISES EVER SINCE.

MILLER'S
BRICK PRESSES,

Introduced 1844 Latest Improved Patents, Aug. 28, 1883.

SAMUEL P. MILLER & SON,
MAUFACTURERS OF

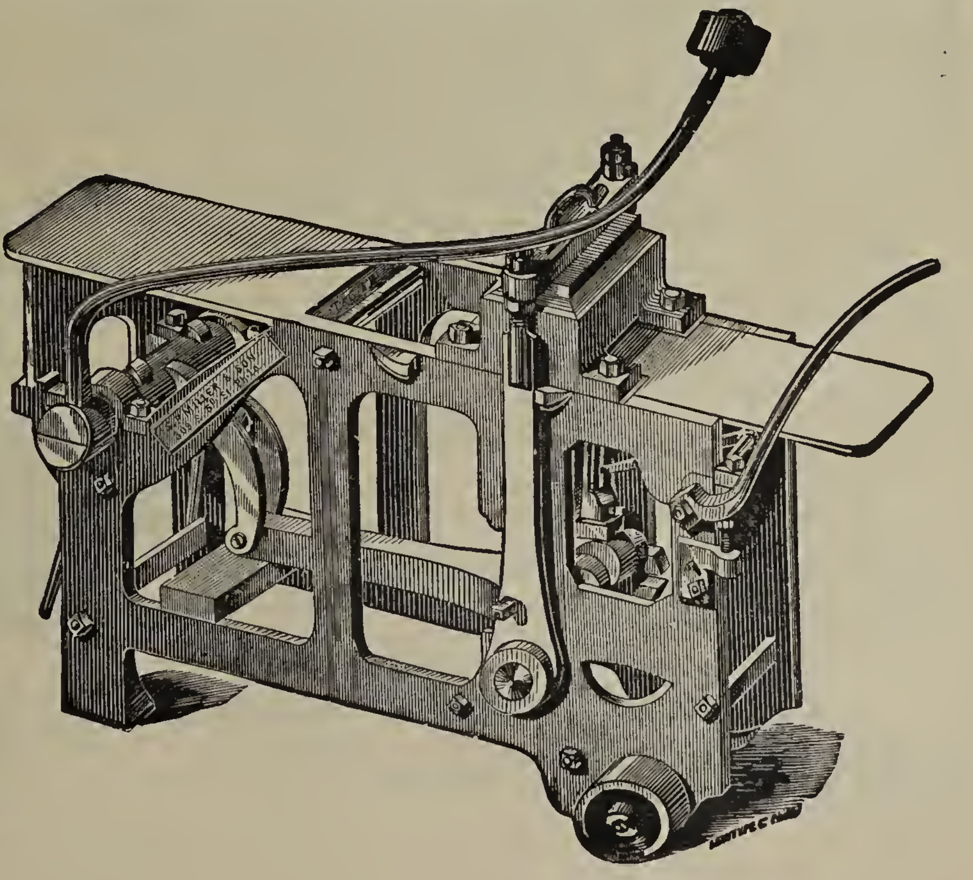
RED AND FIRE BRICK PRESSES,

Of five different styles, embodying all the improvements in Hand Brick Presses in use.

Clay Wheels with Reciprocating Rack, Kiln Castings, Brick Moulds, Clay Spades, and the Tools in General Use for Brick Making.

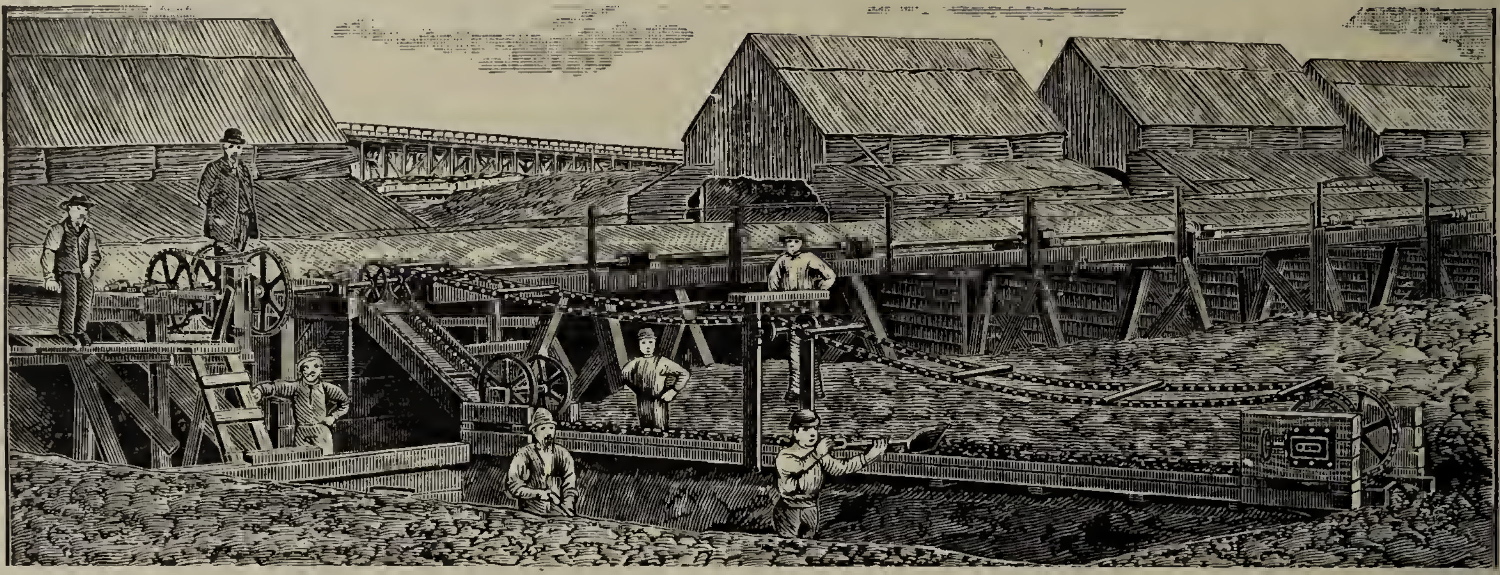
No. 309 SOUTH FIFTH ST., PHILADELPHIA, PA.

S. P. M. & Son refer to Brickmakers generally. ☞ Orders from abroad promptly attended to.



MEY'S CLAY ELEVATOR AND CONVEYOR,

This Elevator is for taking the clay into the brick machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.



It gives the machine a uniform feed, takes less power and manual labor to manipulate and the manufacturer is enabled to make many more thousands of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

It will carry either wet or dry clay and does not clog. There are many of them now in operation and giving satisfaction in every respect. For further particulars and for Catalogue, address

F. H. C. MEY, BUFFALO, N. Y., U. S. A.

THE NEW IMPROVED
CHIEF BRICK MACHINE.

Patented Jan. 1, 1884, *April* 2, 1884, *and the new improvements of* 1887 *and* 1889.

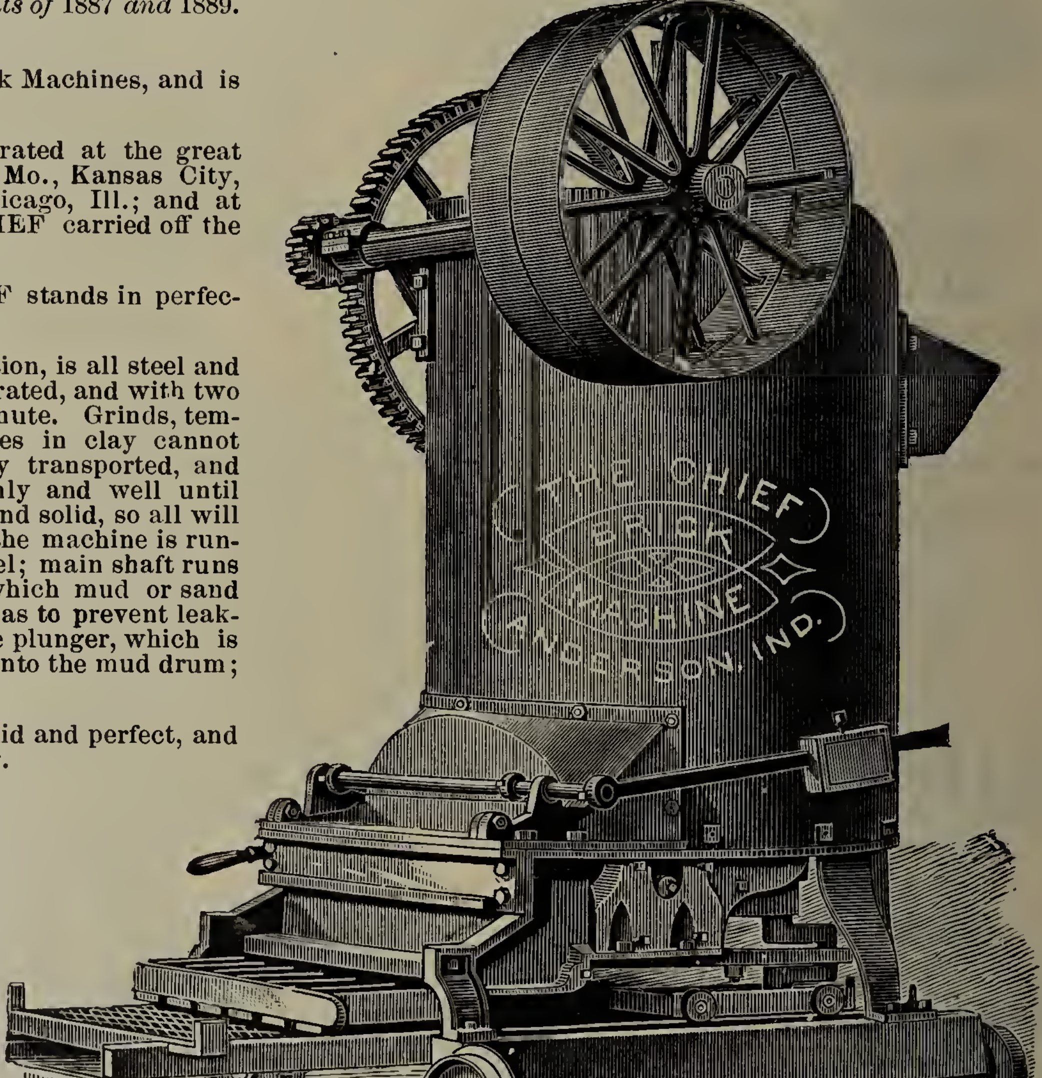
Has taken the lead and stands at the head of all Brick Machines, and is now in operation in every State and Territory in the Union.

In its original construction it was exhibited and operated at the great Southern Exposition at Louisville, Ky.; also at St. Louis, Mo., Kansas City, Mo.; Indianapolis, Ind.; Columbus, O.; Cincinnati, O.; Chicago, Ill.; and at each and all places where premiums were awarded the CHIEF carried off the first prize medal over all competitors.

And with the late new improvements added the CHIEF stands in perfection, at the head of human inventions.

The NEW IMPROVED CHIEF is wonderful in operation, is all steel and iron, and of the greatest strength and durability, is easily operated, and with two horses or a small engine makes 60 to 100 perfect bricks per minute. Grinds, tempers and at the same time moulds into brick any clay. Stones in clay cannot break it, nor interfere with its free operation. It is easily transported, and changed from horse to steam power. It fills the moulds evenly and well until the machine is empty of clay, pressing each brick equally and solid, so all will shrink alike. The pressure can quickly be changed while the machine is running to suit the consistency of the clay. All shafts are of steel; main shaft runs in three boxes or bearings all outside of the machine into which mud or sand cannot penetrate. The wear can at all times be taken up so as to prevent leakage. The clay in the press box is under full control of the plunger, which is direct and positive, and prevents the mud from floating back into the mud drum; this feature is not found in any other mud machine.

Bricks made by the NEW IMPROVED CHIEF, are solid and perfect, and have sharp edges and corners, and do not crumble in burning.



The NEW IMPROVED CHIEF is equally suitable either for small or large yards, the best of bricks are made by it at the least labor and expense, all parts are easy of access and the bearings can be oiled from the outside. All ordinary sizes of brick as well as ornamental brick can be made on the NEW IMPROVED CHIEF and it is especially adapted to making fire brick of any shape with the least danger of breakage and the smallest per cent of lost brick.

The NEW IMPROVED CHIEF is sold on its merits, and warranted to be all that is claimed for it

We will send Circulars and Testimonials of the NEW IMPROVED CHIEF BRICK MACHINE, New Departure Tile Machine, Engines, Etc., Etc., free to any address on application. Address

Anderson Foundry & Machine Works,

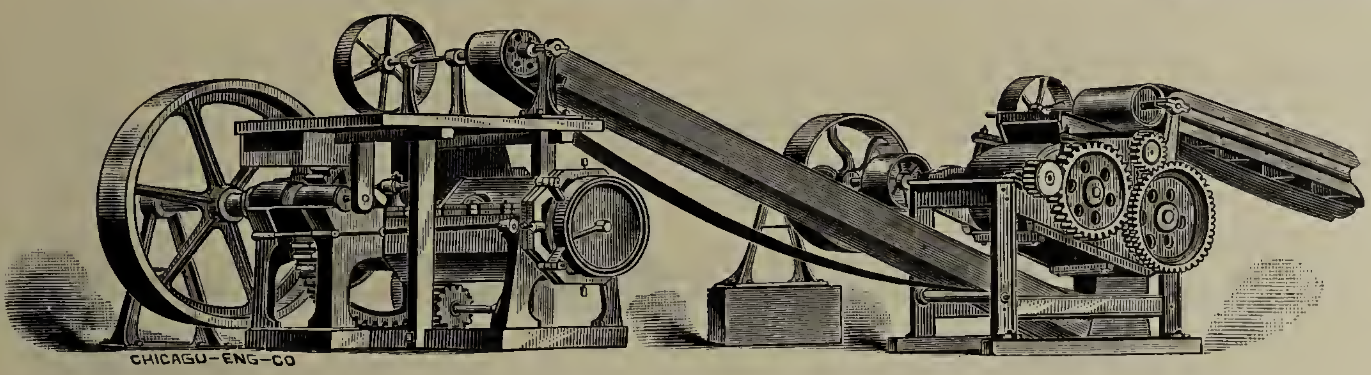
Mention the Clay-Worker.

Anderson, Indiana.

Adrian Brick and Tile Machine Co., Adrian, Mich.,

MANUFACTURERS OF

Brick and Tile Machinery,



Clay Crushers,
Engines
and boilers.

Also Daso's Builders' and Contractors' Elevators. Steam Fittings and Iron and Brass Castings Furnished to Order.

The working qualities of our machinery at its present state of development as estimated by one of the prominent Brick Manufacturing Companies of Kansas City, are stated in the following reply to a letter of inquiry addressed to them:

KANSAS CITY, MO., August 21, 1888.

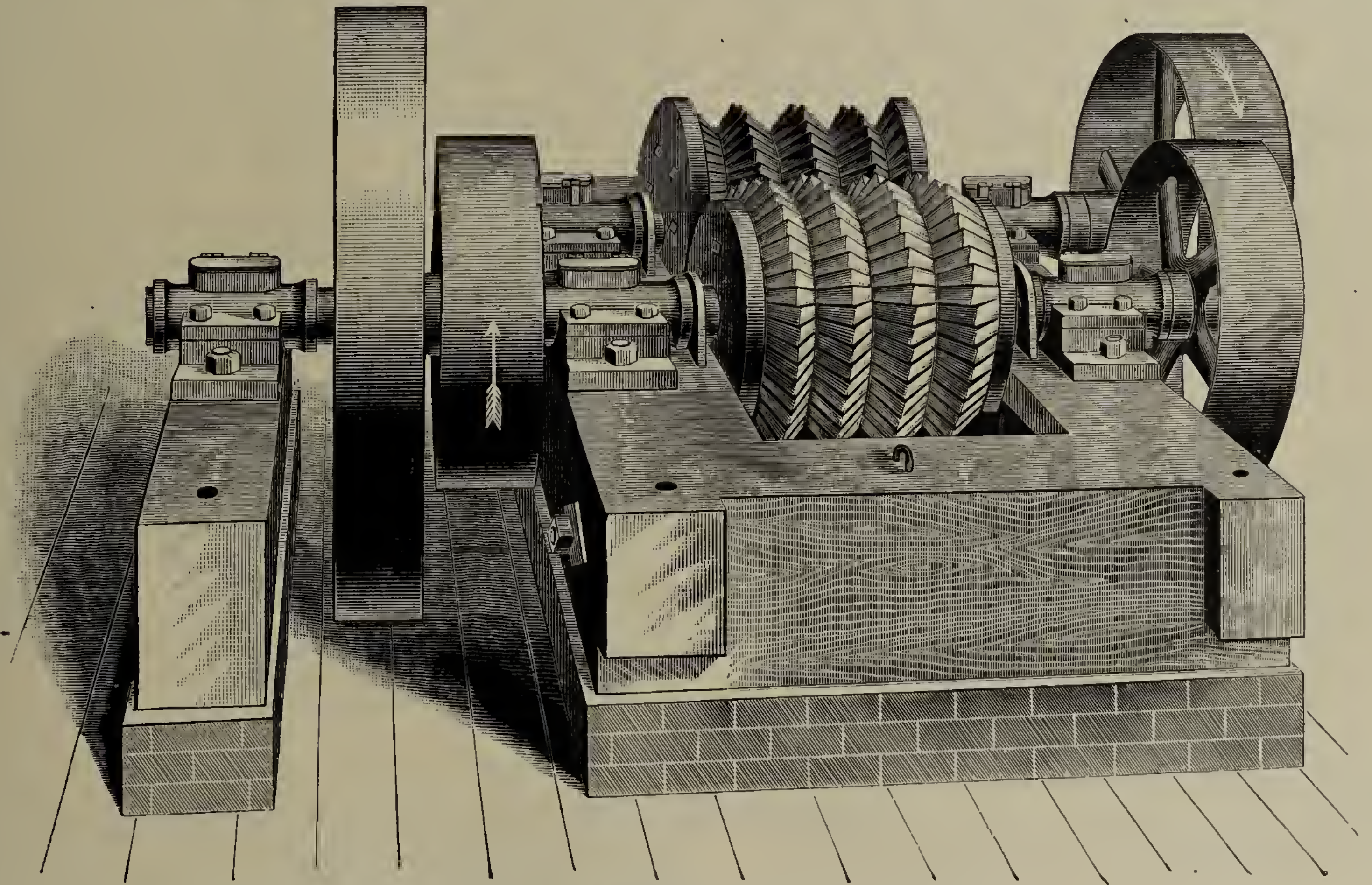
JOHN GIBSON, Esq., Monticello, Iowa:

DEAR SIR—In answer to your favor of the 16th will say, that we do not think there is any room for improvement in the Adrian Brick and Tile Machine Co's No. 4 Cut-off Table, as it cuts the brick as near perfect as possible, without tearing the edges; thus leaving the ends of the brick as perfect as the face. We are also using the new dies on both our machines, and are well pleased with them, as they are 100 per cent. better than the old style and turn out a perfect column of clay without warping or twisting. We have two No. 3 McKenzie machines and they are doing excellent work for us and we averaged during July, 26,800 brick, each, per day. In conclusion we will say that both the new tables and the new dies are so incomparably superior to the old ones that it gives us much pleasure to recommend them.

Very truly yours, SEDDON & EDWARDS BRICK CO.

NEWELL IMPROVED CLAY PULVERIZER

We Guarantee the Material and Workmanship and allow a Trial of our Machine to any Responsible Party.



NEW 19-INCH LETTER C PULVERIZER, WITH HOPPER REMOVED.

Heavy Cold Rolled Shafts running in best Anti-Friction Metal Bearings, protected from dirt.

A FEW OF OUR CUSTOMERS AND REFERENCES:

Henry Maurer & Son, (3 Pulverizers) 420 E. 23rd St., New York City.
Peerless Brick Co., Philadelphia, Penn.
Perth Amboy Terra Cotta Co., (2 Pulverizers) Perth Amboy, N. J.
Syracuse Pressed Brick Co., Syracuse, New York.
Potomac Terra Cotta Co., (2 Pulverizers) Washington, D. C.
Siner & Brother, Frankford, Penn.
W. H. Perot, Baltimore, Md.
The Rathbun Co., Deseronto, Ontario, Canada.
Murrill Dobbins, (3 Pulverizers) Philadelphia, Penn.
American Brick & Tile Company, Phillipsburg, New Jersey.

Send for Illustrated Circular and Price List.

NEWELL UNIVERSAL MILL CO., - 10 Bethune St., NEW YORK.

HUMAN NATURE IS WARY

And PLAIN, HONEST FACTS, carry more conviction than high flown extravagant claims from those having goods to sell.

Therefore we are modest enough to realize that what we would say about our machine would not be as acceptable to the trade as evidence from brick manufacturers who have used our machine.

Would those who have used them have any interest in misstating the facts to the detriment of other fellow brick manufacturers? You know they would not, and can accept their evidence, but should you be still skeptical, write us asking where the nearest machine to you is, then go and visit the yard and see for yourself, and then you don't have to depend on anyone's word.

There will be a machine not far from you as they are in nearly every State and Territory.

Our different machines are profitable for the smallest as well as the largest yards, we having three sizes of machines to which can be added auxiliary machines greatly increasing capacity and profit for the large yards. Some horse-power yards only want to make 1,500 per hour, while steam power yards run up to 45,000 to 50,000 per day, if wished.

We guarantee them to successfully work any clay that can be successfully worked by hand or any other machine. What more could you ask? Our prices are lower than all others except one or two whose machines as well as prices are TOO CHEAP. LOOK OUT FOR THAT CLASS.

Therefore we will present each month, statements from both large and small yards.

Read These and Watch For the Fresh Ones Next Month.

FROM STEAM-POWER YARDS.

HELENA, MONTANA, October 7th, 1889.

GENTLEMEN—In reply to yours of the 23rd ult. regarding brick machinery purchased of you last spring, I will say that the four extra heavy Fletcher & Thomas pug mills in connection with the four Extra Heavy "New Quaker" Brick Machines, have given perfect satisfaction from the first day that we started. We also have four mould sanding machines. The day's work has been 30,000 per machine, and we have not found any difficulty in making that amount in nine hours, and we have made that amount in seven hours. I can highly recommend the machines and pug mills to any one contemplating purchasing soft mud machinery. Any one who may wish to visit this yard during the brickmaking season I will gladly explain the merits of your machinery to them. I remain,

Yours truly, CHARLES H. BRAY,
Supt. N. Kessler's Brick Yard

KANSAS CITY, MO., Oct. 5th, 1889.

GENTLEMEN—Several parties have been at our yard and asked our opinion of your machinery, and we gave them a demonstration of what the machine could do, that convinced them of the merits and worth of the "New Quaker" as a soft mud machine. We are running out 40,000 per day of 10 hours, and yesterday with but little extra effort we made 44,000. Yours very truly, GATES & BROOKS.

DEFIANCE, OHIO, Oct. 19th, 1889.

GENTLEMEN—The "New Quaker" Steam machine purchased of you this spring past, gives entire satisfaction. We think it the best clay-worker in the world for the money it cost. We make 22,000 choice brick per day running eight hours per day. We have made 2,300,000 with it this season and never had a minute's trouble.

Yours truly, HARMAN TRAMPE.

MINNEAPOLIS, MINN., Oct. 21st, 1889.

GENTLEMEN—The two Extra Heavy "New Quaker" machines which we bought of you at the beginning of the season have given us much satisfaction as the one you sent us last year. They have done better than you promised they would do. We gladly recommend them.

Yours truly,
WISCONSIN RED PRESSED BRICK WORKS.

FROM HORSE-POWER YARDS.

HARTFORD, CONN., Oct. 5th, 1889.

DEAR SIRS—Yours received in regard to how I like the horse-power "New Quaker" Brick Machine. The more I use it the better I like it. It is THE machine for a small yard. We make more and better brick with a small gang of men than any machine I have seen yet. I run it with five men and make 1,600 good nice brick per hour with ease. I say to any one that wants a good machine that the "New Quaker" is the one for profit. Yours truly,

ELIJAH MILLS.

MOUNT VERNON, OHIO, Oct. 16th, 1889.

GENTLEMEN—In reply to yours of the 24th ult. will say that I am well pleased with the "New Quaker" horse power machine that I bought of you last spring. It makes a better brick than I can make by hand, and I am speaking from a twenty years' experience in the brick business. Therefore I would advise anyone making brick by hand, to buy a "New Quaker" Brick Machine because you can make more and better brick and cheaper.

Yours very respectfully, F. C. WOLFE.

VINELAND, N. J., Sept. 26th, 1889.

GENTS—The "New Quaker" Brick Machine is just the thing to make brick. Can make 2,000 an hour with six men, and make a perfect brick. The men and myself knew nothing about the machine, but we have never been hindered one minute, nor has it cost one cent for repairs. I am perfectly satisfied with it.

Yours very truly, G. A. IRISH.

CANTON, OHIO, October 16th, 1889.

GENTLEMEN—Yours at hand and in reply will state that I am perfectly satisfied with your "New Quaker" Brick Machine and consider it fully equal if not superior to any brick machine. The fact of my purchase of a second machine should be a guarantee to you of the good opinion I have of the "New Quaker." From the time that I purchased the first machine until I got the second I saw different machines work but I like yours the best of all.

Yours respectfully, GEORGE LEBEAU.

SYRACUSE, N. Y., Oct. 29th, 1889.

DEAR SIRS—Your machine is a "dandy" without doubt. It has given me great satisfaction and worked like a charm. I think it the greatest machine for making brick I ever saw. You cannot praise the machine too highly. Yours respectfully, TIMOTHY NOLAN.

☞ We are making a Brick Barrow that we think the best in the country. Also all other supplies.

BENNETT BROS. & CO., Wellington, Lorain Co., Ohio.

THE BEST THE CHEAPEST.

A FEW WORDS IN TIME.

1. If you wish to secure the latest Improvement in Brick Machinery, (the only original Relief Pitman),

2. If you are making brick to make money,

3. If you wish to make true, square Brick and mould them stiff,

4. If you wish to start up in the morning and count on making a full day,

5. If you are not wedded to any one machine but are open to conviction, and will believe what your eyes behold,

6. If you will but look around you and see just what machines our "Automatic" is replacing (all for some very good reason),

7. If you will investigate but a little and see what responsible firms are now adopting our machinery,

8. If you will believe us when we say that our orders are received only after the purchasers have made a thorough investigation of other machines,

9. If you would profit by the (rather expensive) experience of others,

10. If you wish to purchase the "cheapest" machine on the market, (not necessarily the lowest price),

11. If you wish to deal with first hands, [no commissions or expenses of high salaried traveling men],

12. If you wish to secure in a Brick Machine the three essentials—Strength, Convenience and Capacity,

13. If you are well supplied with brick machines, but want a Pug Mill, Disintegrator, Elevator, Mould Sanding Machine, [the original and only Sander] greatly improved, or need a few Trucks or Barrows,

14. If you wish to obtain one of our Improved Chilled Roll Disintegrators, and are not easily bluffed by envious competitors,

15. If you will but come to Cincinnati and ascertain personally just what we are offering in the line of machinery for the advancement of brick making.

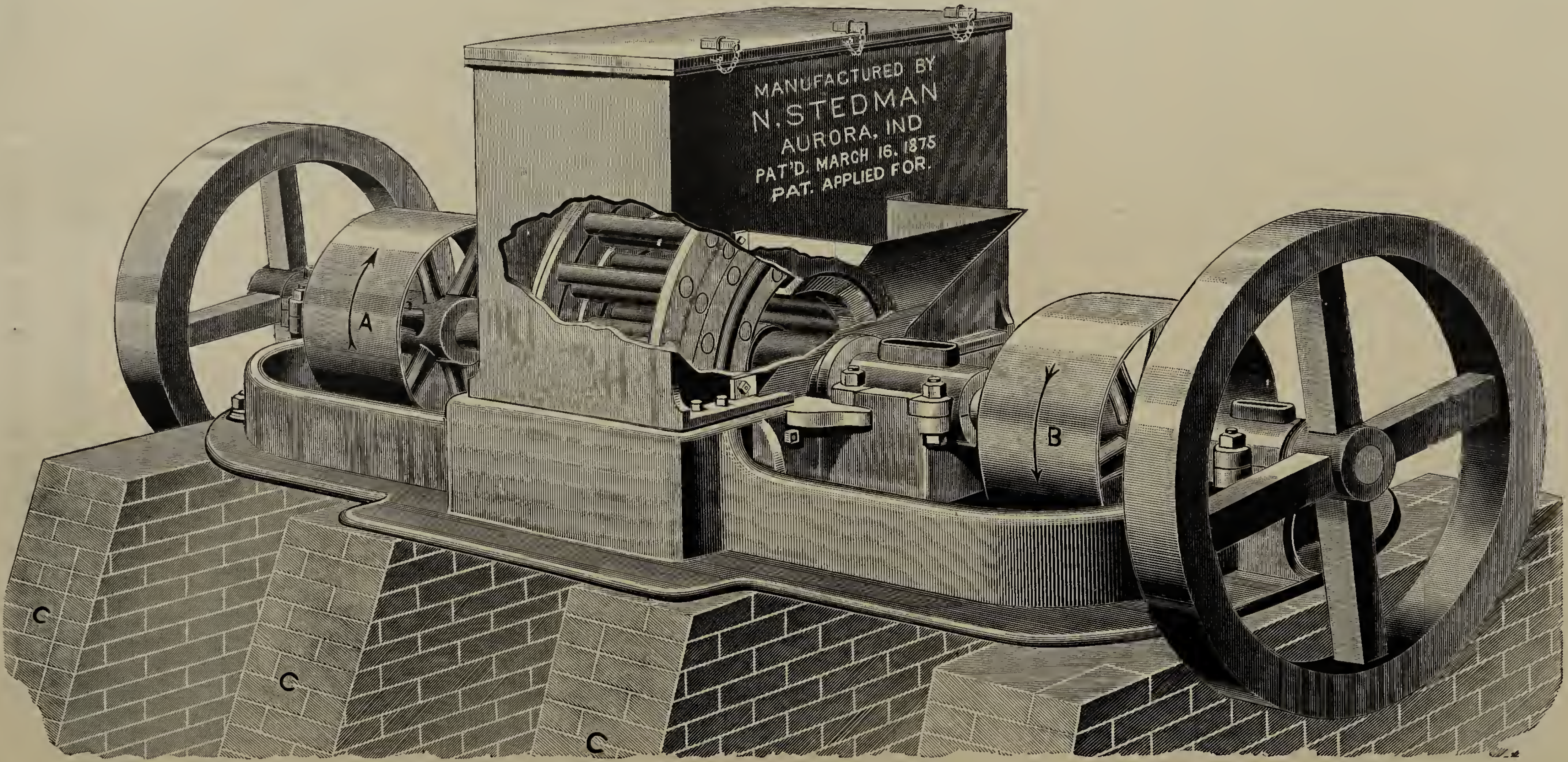
16. If you wish to establish the reputation of making the best brick in your vicinity,

Your correspondence is solicited, COME AND SEE.

JONATHAN CREAGER'S SONS,
Cincinnati, Ohio.

P. S. Because we do not blow or bluster, do not for a moment think we have ceased to bnild anb sell our Improved Disintegrators, we are selling them right along and never miss making a sale to any Brickmaker who knows a good thing when he sees it.

Stedman's Improved Disintegrator and Pulverizer.



To Brick, Tile and Pottery Men and to Terra Cotta Works, this Mill is invaluable. It reduces the clay to a fine, light and soft condition, with its full adhesive properties retained.

This mill will disintegrate or pulverize the following materials: Clay of all kinds, Shale and Slate direct from the bank for Brick and Tile, Fire Clay and Sand Stone Rock—for Cement and Fire Brick—Iron Ores of various kinds, Guano, Phosphates, Bones—green, dry and steamed—Tankage, Bone-Ash. Salt Cake, Soda, Cracklings, Oyster Shells, Animal Matter in almost all conditions, Old Fire Brick and Tiles, Old Pottery Ware, Plastic Clay, Asbestos, and in fact, almost any material that can be disintegrated.

A good Disintegrator and Pulverizer is a long felt want in many branches of business. This Mill is an improvement over any yet made and is the result of practical experience. It is made in three sizes: 30, 40 and 48 inches. The capacity for clay is as follows: 34-inch Mill will pulverize for from 15,000 to 25,000 brick per day. 40-inch Mill will pulverize for from 20,000 to 35,000 brick per day. 48-inch Mill will pulverize for from 75,000 to 100,000 brick per day. For prices and further information, address

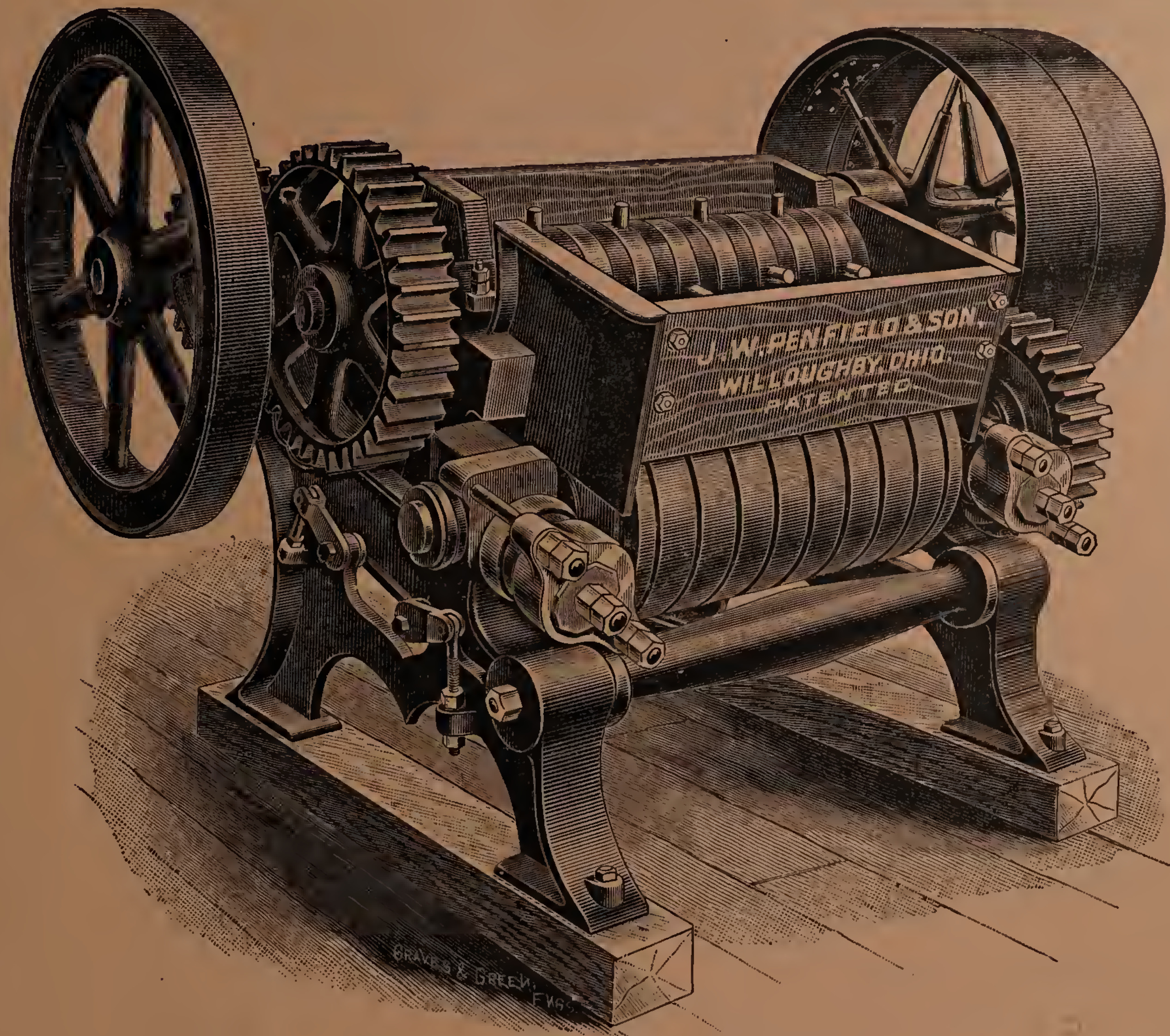
STEDMAN'S FOUNDRY AND MACHINE WORKS,
AURORA, IND.

PROTECTED BY PATENTS.

Mention the Clay-Worker.

THE PENFIELD CLAY CRUSHERS AND ELEVATORS.

Iron Dry Cars and Turn Tables
A Specialty.

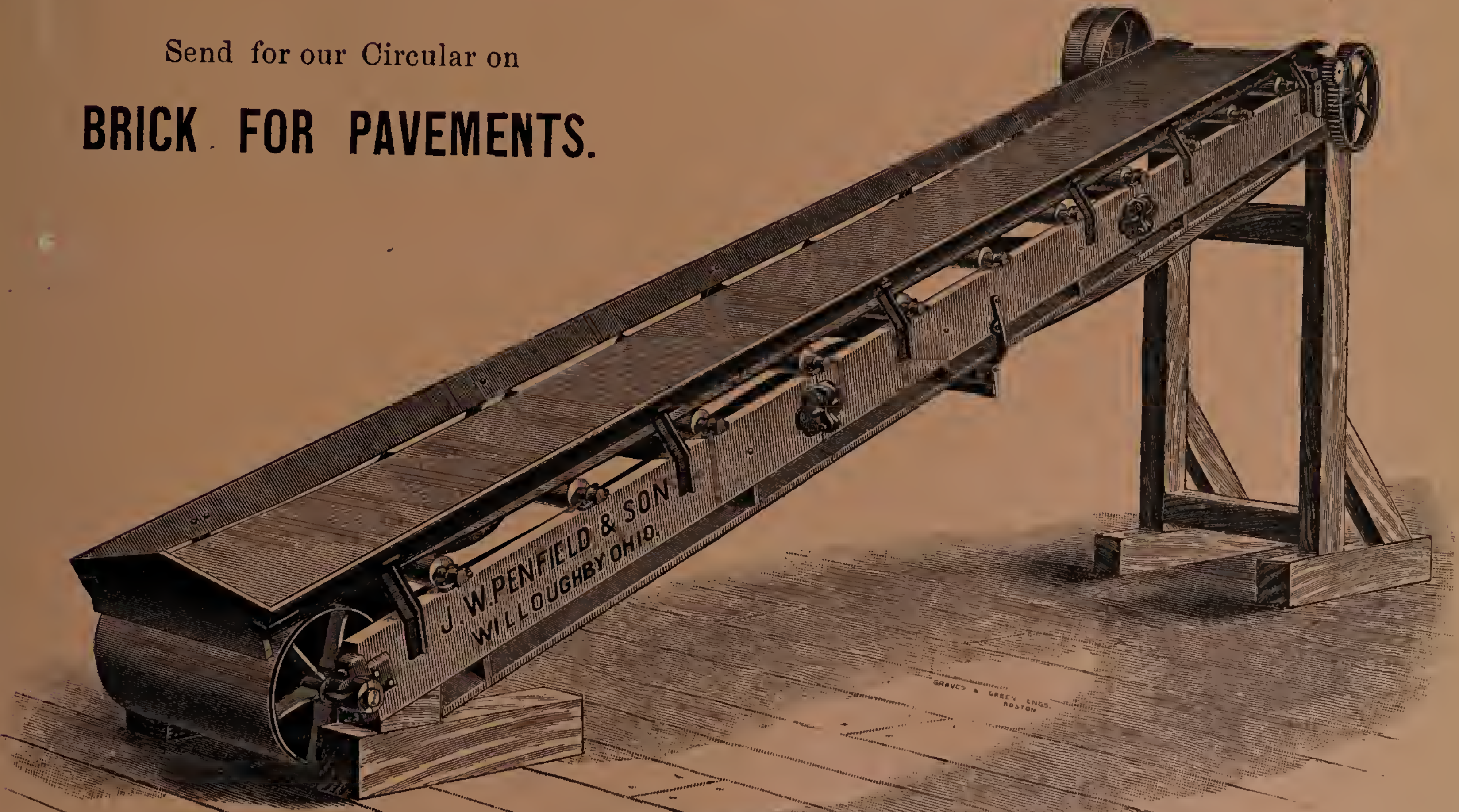

J. W. PENFIELD & SON.
WILLOUGHBY, OHIO.
PATENTED.
GRAVES & GREEN, ENGS.

Line Shafting, Pulleys, Hangers,
and Yard Supplies.

(NO. 3 CORRUGATED CRUSHER AND STONE SEPARATOR.)

Send for our Circular on

BRICK FOR PAVEMENTS.



RUBBER APRON CLAY ELEVATOR.

☛ For particulars address the manufacturers,

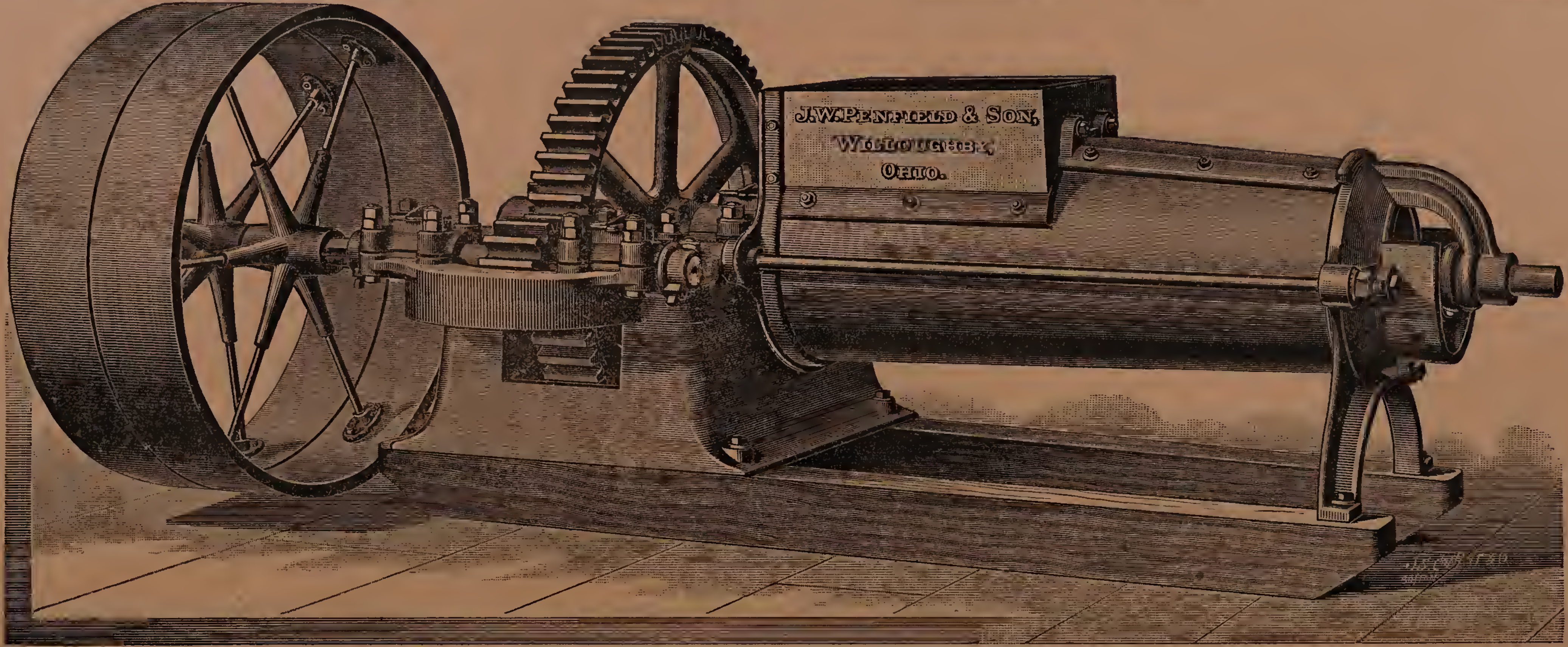
J. W. PENFIELD & SON, - Willoughby, Ohio, U. S. A.

THREE MAXIMS WORTH HEEDING.

THE BEST
IS
THE CHEAPEST.

THE PENFIELD
IS
THE BEST.

THEREFORE,
ALWAYS BUY
THE PENFIELD.



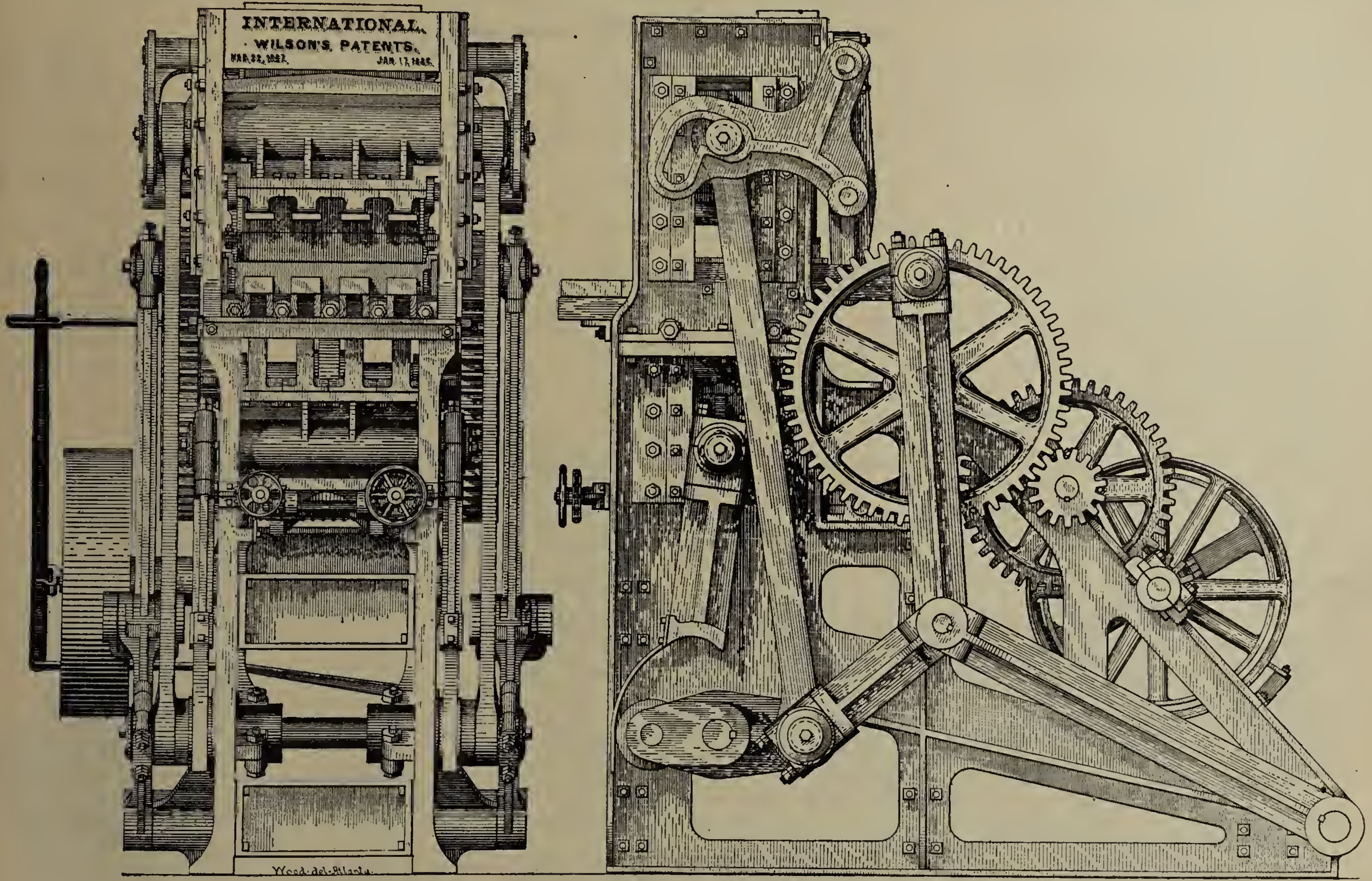
(NO. 7 S. HORIZONTAL PUG MILL.)

Stiff Clay Machinery for Paving and Building Brick. Upright Stock Brick Machine for Sand Mould Brick. For particulars, address

J. W. PENFIELD & SON,
Willoughby, Ohio, U. S. A.

(Mention Clay-Worker.)

The International Semi-Dry Brick Press.



It is admitted by experts that this machine leads all other steam brick machines not only in pressing power, but strength and simplicity of construction as well as amount and excellence of product. The power ex-exerted on the lower dies is not wasted on dead abutments, but reciprocated by the upper dies and at the same time balancing all strain. The International weighs about 14,000 lbs. Can be shipped intact all ready for work. Any intelligent laborer can operate it. All bearings and guides are outside the frame secure from wear by falling clay.

◆

JOHN F. LANG'S TESTIMONY,

Tallapoosa, Ga., June 29, 1888.

Mr. B. J. Wilson, Atlanta, Ga.: DEAR SIR—The "International" four-brick Semi-dry Brick Press bought of you is giving entire satisfaction. Our regular speed is 18 revolutions to the minute, but we often run as high as 20, thus establishing its capacity at 48,000 brick in 10 hours. The character of the work is first-class in every particular—no granulations, all corners firm and sharp even in the salmon brick. Yours Very Truly,

JOHN F. LANG, Pres. Tallapoosa Mallable Iron Co.

Owing to ill health and the infirmities attendant on old age, I am unable to put this machine properly upon the market and would be pleased to correspond with parties with a view to selling such an interest as will secure that end. In my condition, I am prepared to give a great bargain. As to personal reliability, commercial standing, I refer to all banks and business men in Atlanta Correspondents will please give references.

N. B.—The cost of building will be found 25 per cent. lower than any other machine on the market.

B. J. WILSON, PATENTEE,

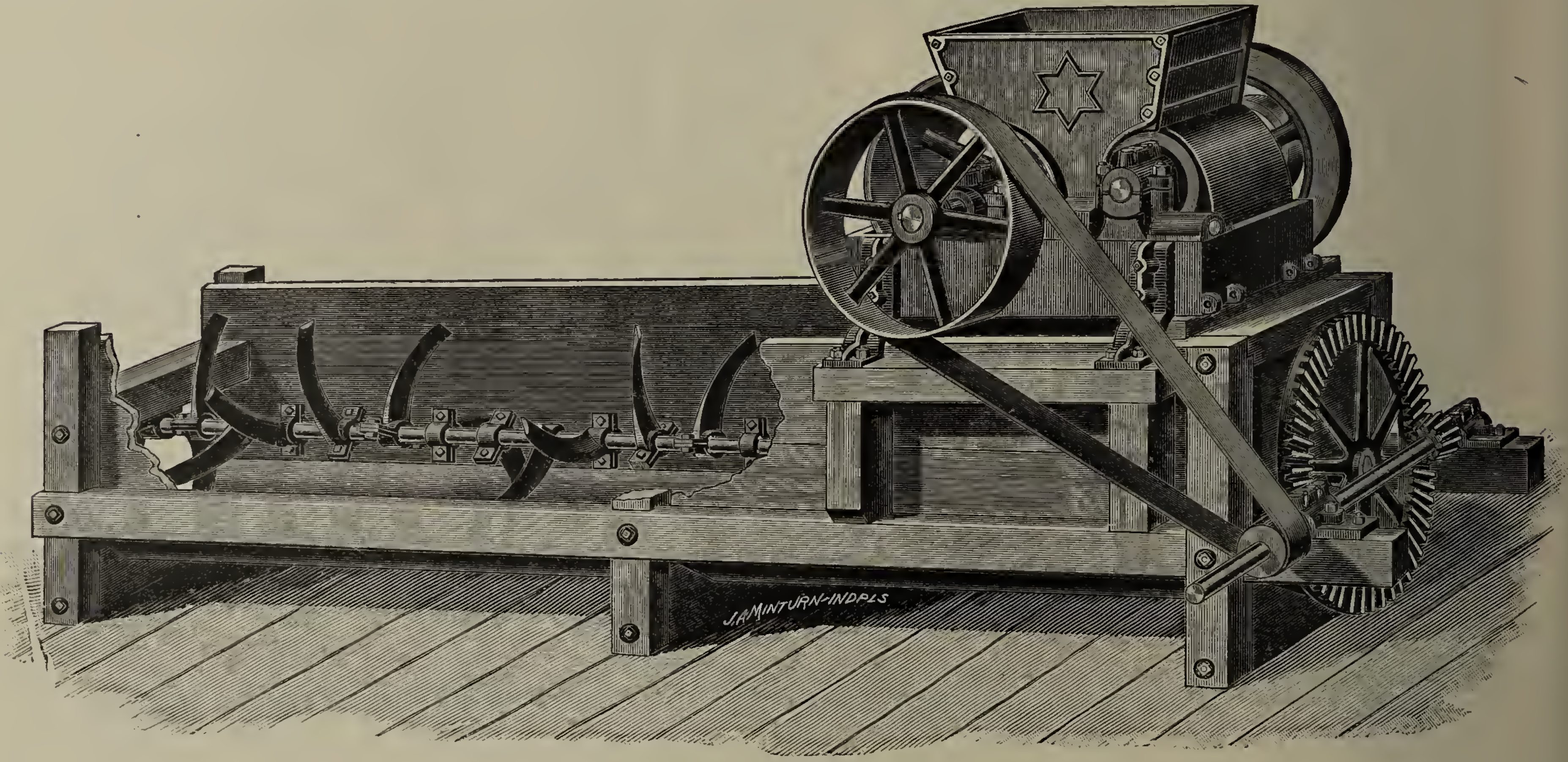
(Mention Clay-Worker.) **West End, Atlanta, Ga.**

BRICKMAKERS!

IF

You are intending to make IMPROVEMENTS in your plant there is no machinery you can purchase which will make as large saving for the amount of money invested and improve the quality of Brick made as our COMBINED PUG MILL and DISINTEGRATOR.

It will work the clay direct from bank, saving all PIT SOAKING, and extra handling of clays, as well as $5 to $6 per day in labor.



The Disintegrator will thoroughly pulverize all lumps and clods, dry or wet, it does not clog or choke as roller crushers do, the clay is ground fine and is in the best possible condition to take water.

Our machinery is strong and durable, has no light or complicated parts to wear or break.

A WARNING.

Jonathan Creager's Sons, of Cincinnati, Ohio, are now manufacturing a Clay Disintegrator which is an infringement on our Patents. We have brought suit against them in the United States Circuit Court for the Southern District of Ohio.

We presume that this will be accepted as a sufficient answer to their statements in May number of Clay-Worker that our former notice was meant for bluff only.

We intend fully to protect our rights, and only waited until it was apparent that they were being wilfully infringed to bring suit.

Our Patents are numbers 322,393, *dated July* 14*th*, 1885. 368,898 *dated August* 28*th*, 1887, *and* 384,278 *dated June* 12*th*, 1888.

☞ Write for prices and terms.

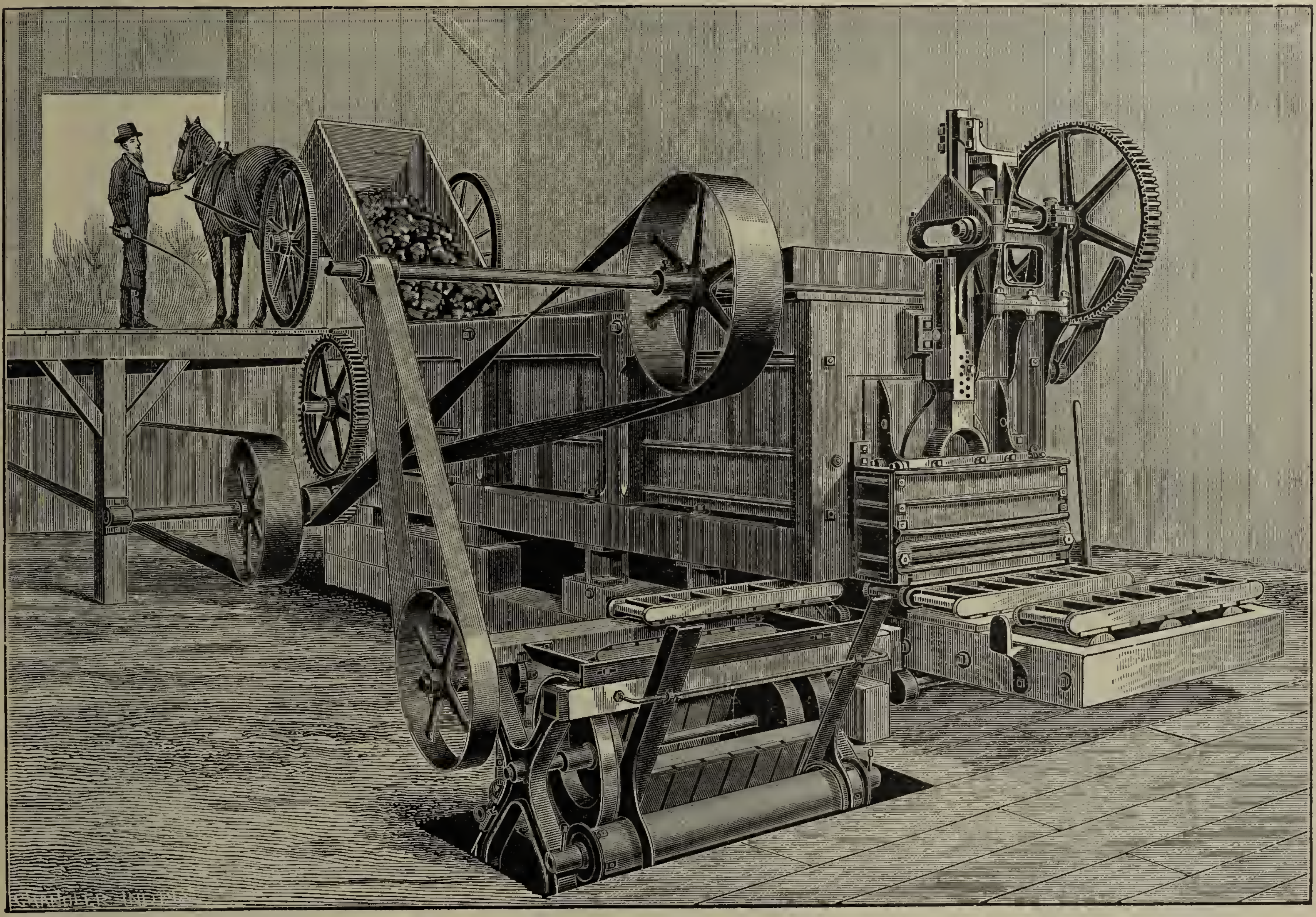
C. & A. POTTS & CO., - - Indianapolis, Ind.

A GRAND SUCCESS

—— AND ——

Has no equal for Strength, Durability, Quantity and Quality of Brick Made.

Working the clay direct from the bank without use of extra Pug Mill.



It has the **largest tempering capacity** of any machine on the market.

All brick made have **clean, smooth** surfaces and **sharp corners.**

It has no springs or light complicated parts to get out of order, and cause delays.

No working part underneath machine where dirt and dust can collect and cause them to wear rapidly. All parts are out where they can be **kept clean** and **oiled.**

We are prepared to erect complete plants of any desired capacity and keep in stock a full line of **Brick Machines, Pug Mills, Disintegrators, Mould Sanders, Clay Cars** and **Drums.**

☛It will pay you to write us for prices.

C. & A. POTTS & CO.,

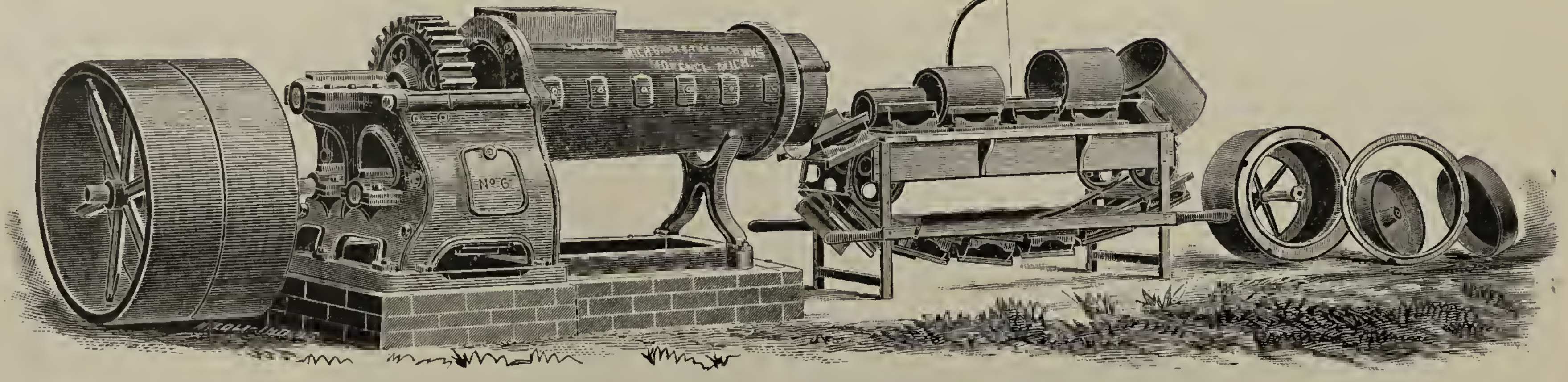
INDIANAPOLIS, INDIANA.

[Mention this paper.]

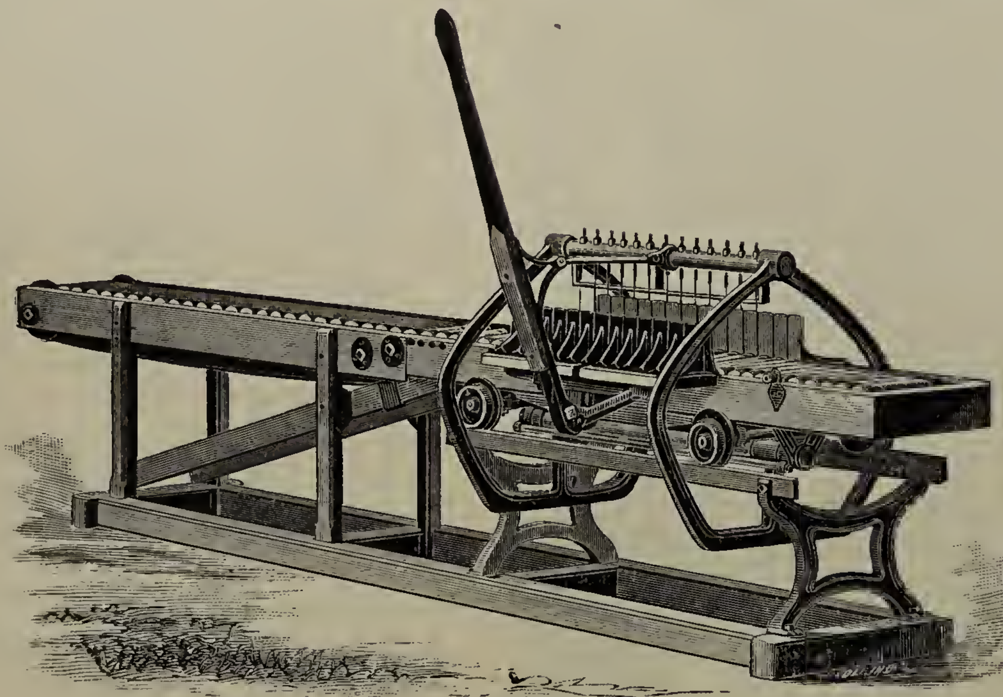
Michigan Brick & Tile Machine Works,

—MANUFACTURERS OF—

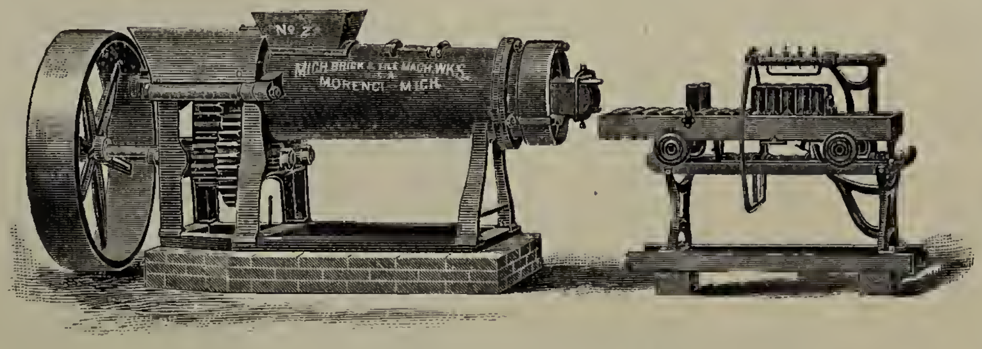
BRICK AND TILE MACHINERY.


MICH. BRICK & TILE MACH. WKS.
MORENCI, MICH.
No. 6

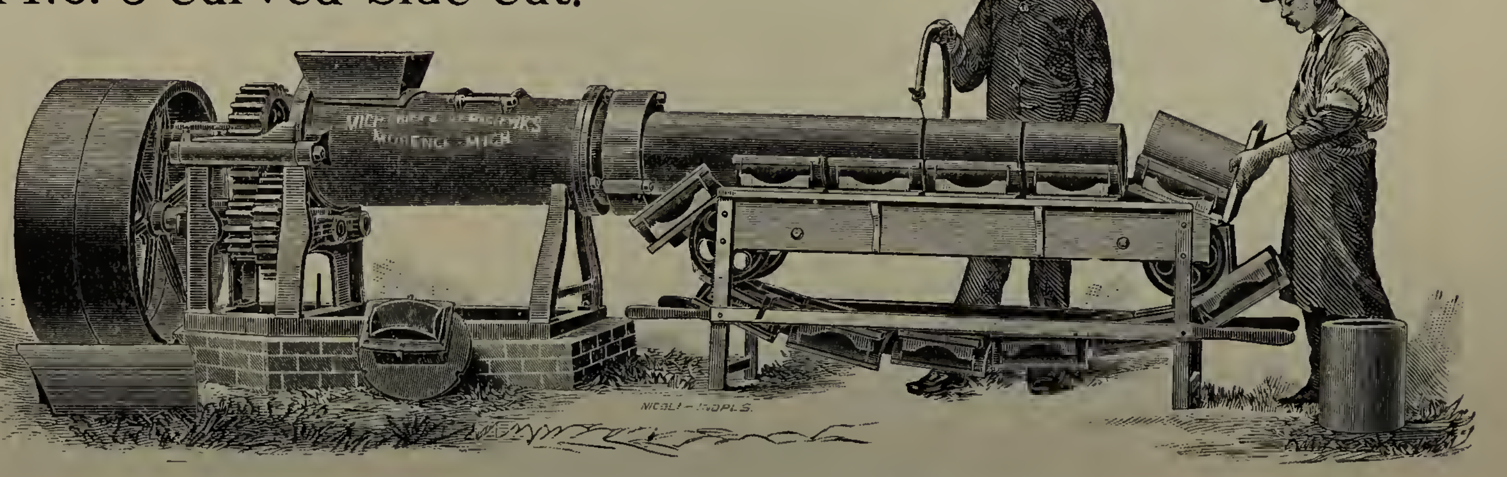
No. 6 Special Brick and Tile Machine.



Special No. 6 Curved Side Cut.


No. 2
MICH. BRICK & TILE MACH. WKS.
MORENCI, MICH.

No. 2 Brick and Tile Machine.


MICH. BRICK & TILE MACH. WKS.
MORENCI, MICH.

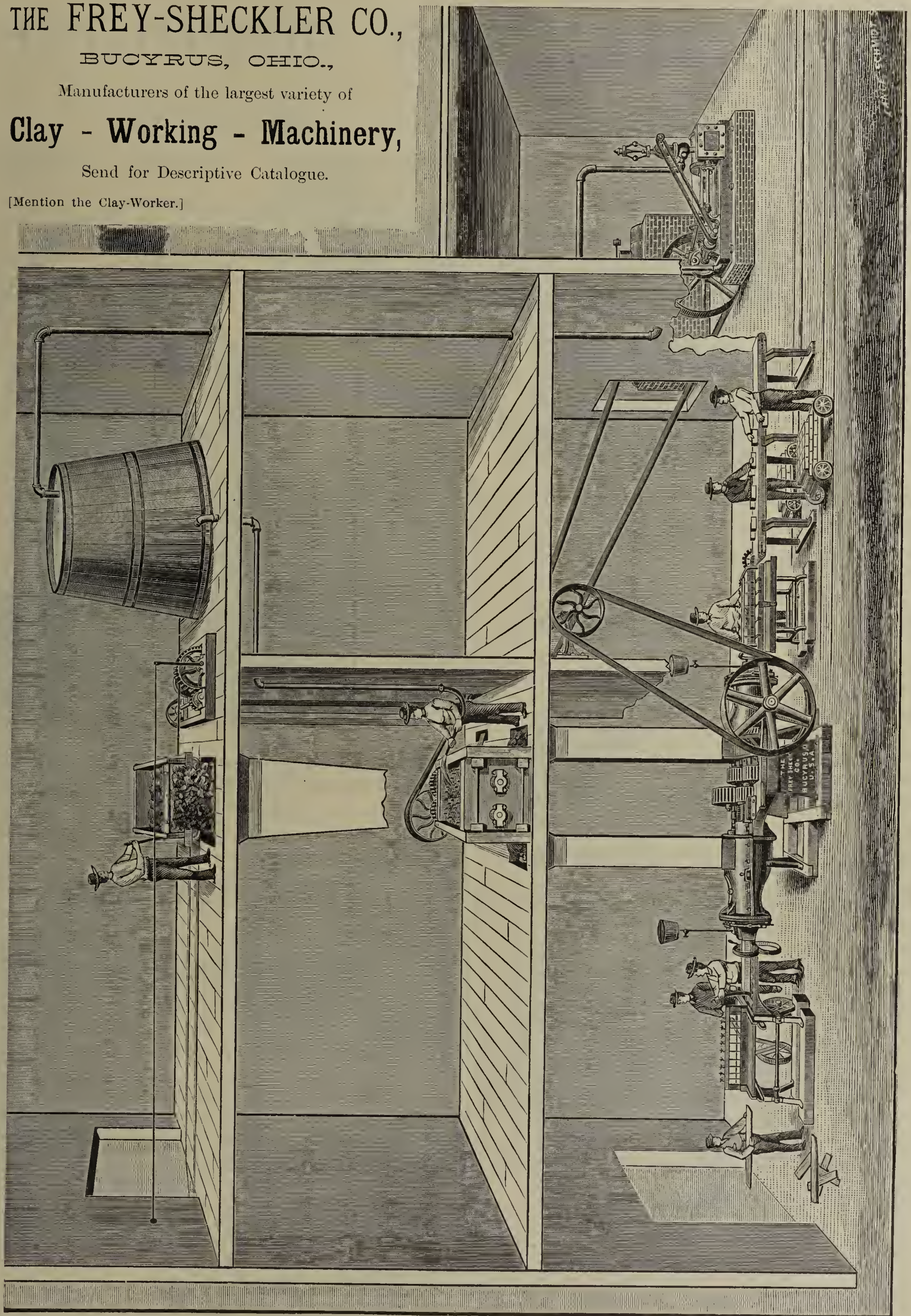
No. 1 Brick and Tile Machine.

☞Send for Descriptive Circular.

MICHIGAN BRICK AND TILE MACHINE WORKS,

Lenawee County. [Mention the Clay-Worker]. MORENCI, MICH., U. S. A

THE FREY-SHECKLER CO.,
BUCYRUS, OHIO.,
Manufacturers of the largest variety of
Clay - Working - Machinery,
Send for Descriptive Catalogue.
[Mention the Clay-Worker.]


THE FREY-SHECKLER CO. BUCYRUS O. U.S.A.

BRICK FACTORY WITH DOUBLE ACME BRICK MACHINE AND PUG MILL.

BRICK - MAKERS' - SUPPLIES.

RAYMOND'S

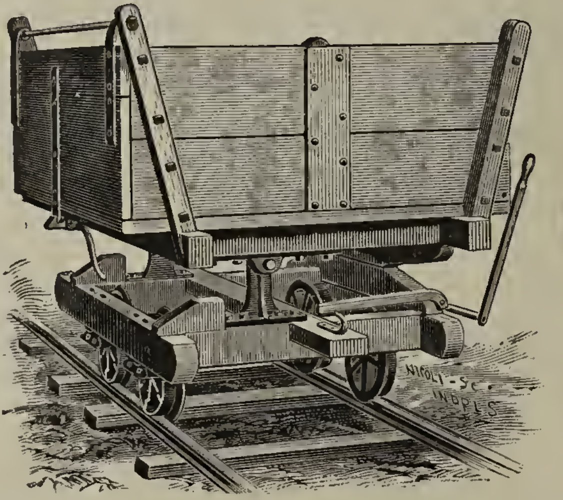
AUTOMATIC - DUMPING - CARS.

- WITH -

PORTABLE TRACK

- - AND - -

WINDING DRUM.

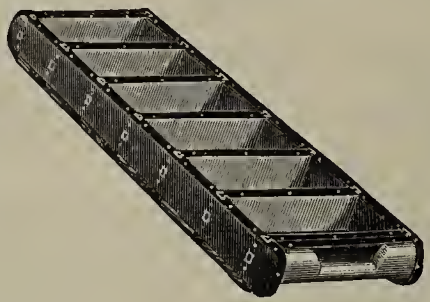


For Brick Yarbs, Gravel Pits, Plantations, Mines, etc. No labor is required either to dump the load or return the empty bed to position. Write for Illustrated Catalogue giving full description.

BRICK - MACHINE - MOULDS.

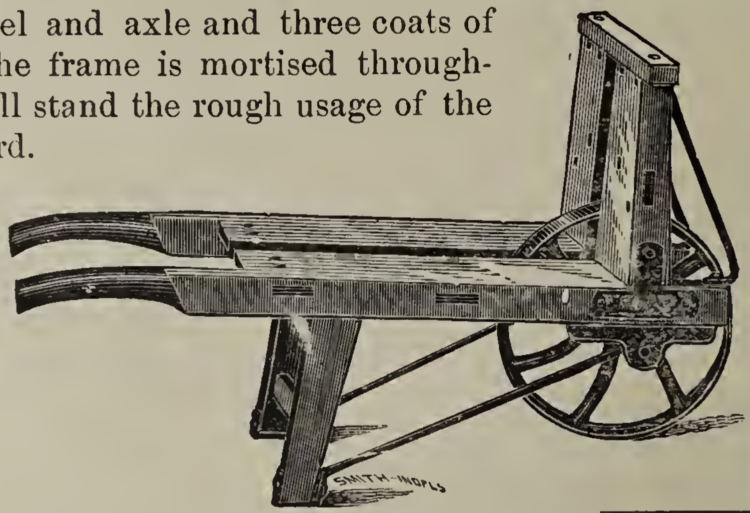
We manufacture a great variety of moulds and are able to fill orders with dispatch. Our moulds are made of the best of cherry wood, iron bound.

Send for Circular.



"IDEAL" BRICK - BARROW.

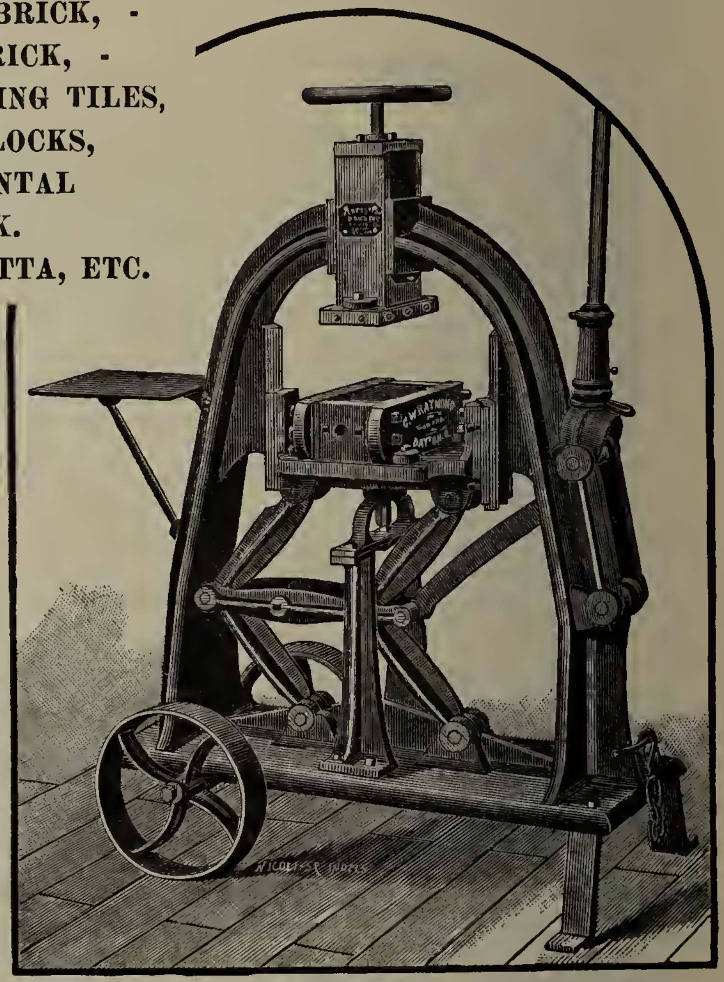
Our Barrows are made from the best of seasoned white-oak, braced in front and cross braces underneath; iron wheel and axle and three coats of paint; the frame is mortised throughout. Will stand the rough usage of the brick yard.



RAYMOND'S

PERFECTION - BRICK - PRESS.

FOR RED BRICK, -
FIRE BRICK, -
ROOFING TILES,
PAVING BLOCKS,
ORNAMENTAL
WORK.
TERRA COTTA, ETC.



A short but powerful movement of one lever only, is required in pressing the brick. An easy working, quick acting, and powerful machine.

OUR - LATEST.

Our No. 4 Power Press, with automatic feed and delivery is the most complete and rapid mechanism for handling and pressing brick ever made.

Its Capacity,

Ten Thousand Perfect Pressed Brick per day.

but limited only by the ability of the operator to feed it.

The entire product of a plant can be repressed upon this rapid working and simple machine at a cost not exceeding 30 cents per thousand.

We invite investigation of its merits.

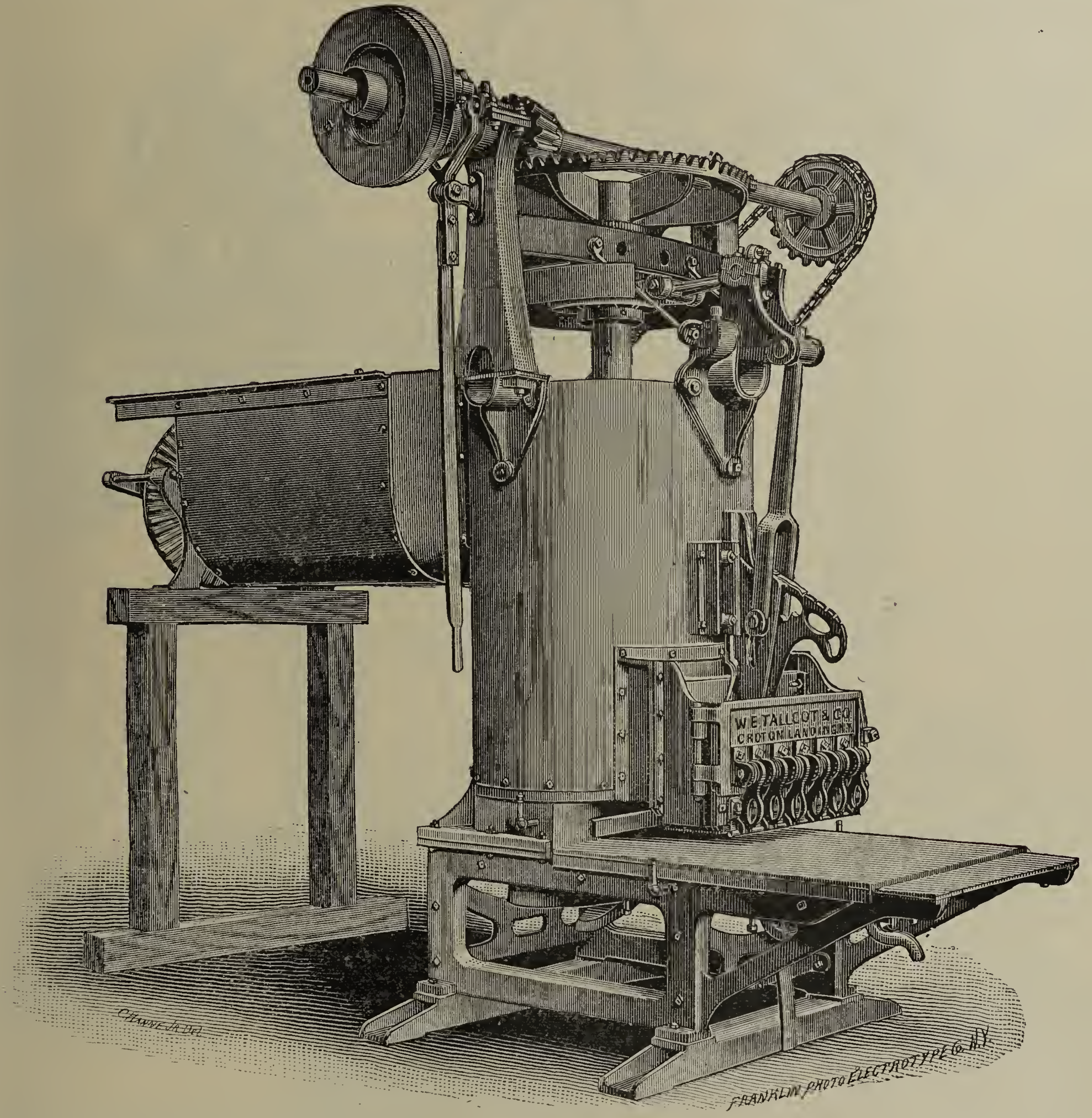
C. W. RAYMOND & CO.,

DAYTON, OHIO.

[Mention the Clay-Worker.]

W. E. TALLCOT & CO'S.

I. X. L. Brick Machine and Improved Pug Mill.


W. E. TALLCOT & CO.
CROTON LANDING, N.Y.
C. HAWE JR. DEL.
FRANKLIN PHOTO ELECTROTYPE CO. N.Y.

This is a simple and powerful machine, making a superior brick and possessing advantages over all others. It is the result of years of experience in using and manufacturing brick machines. Among its advantages are *Great Strength, Simplicity and Durability* few parts, well protected from sand, yet easy of access for adjustment, renewal and repair. No wood is used in its construction; it is made all of iron and steel. Perfect automatic action to prevent breakage by stones or other obstructions. Great tempering capacity and ability to mould very stiff clay. It is easily understood, easily operated, easily kept in order. Quality of brick made, unsurpassed.

The I. X. L. is eipecially designed and built for heavy work. Weight of Machine and Pug Mill 10,000 pounds. Weight of Machine without Pug Mill, 7500 pounds. Send for circular and prices.

It will pay you to use the I. X. L.

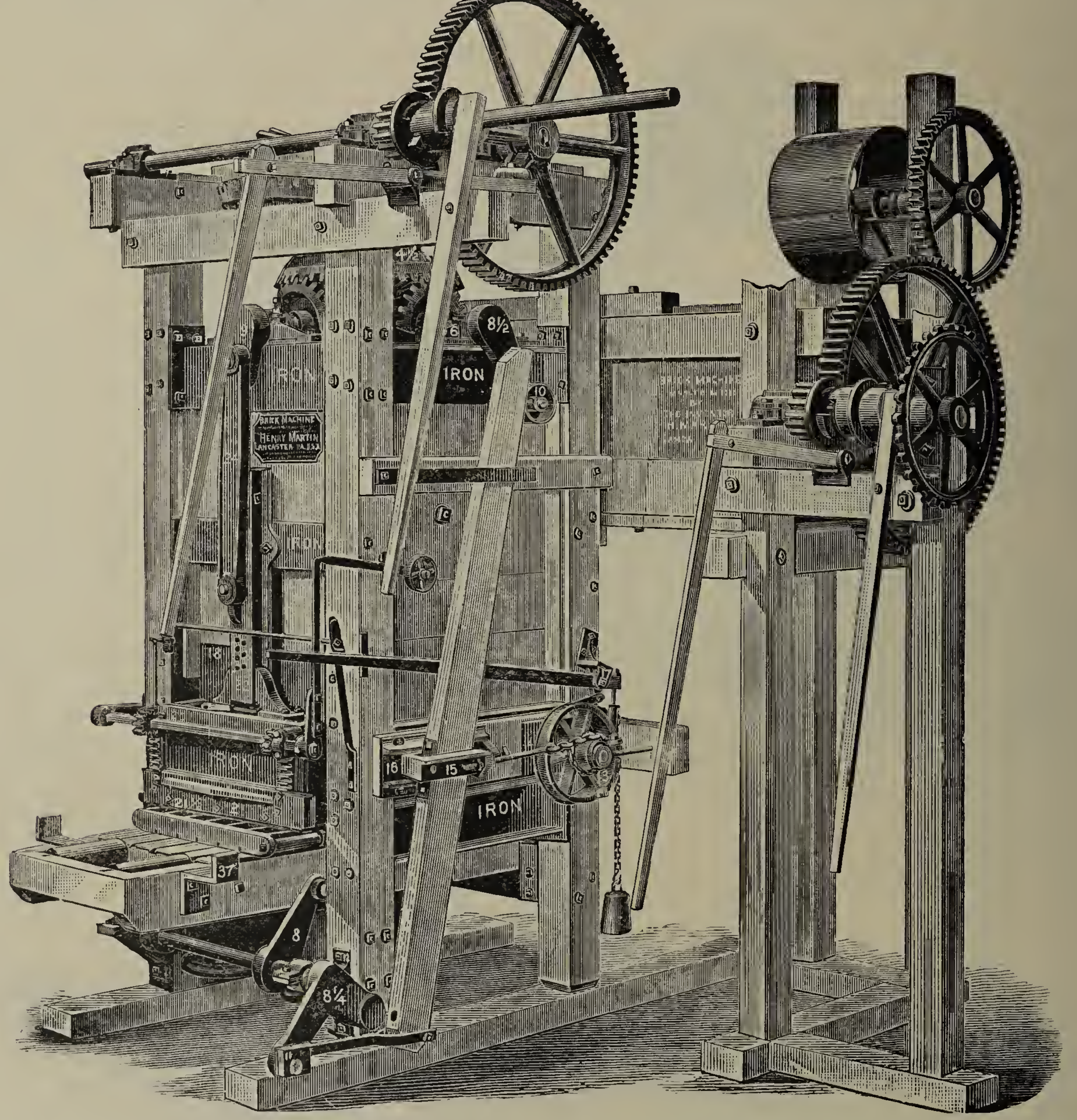
W. E. TALLCOT & CO.,

Croton Landing, New York

The Henry Martin Brick Machine.

For Steam or Horse-Power.

WITH OR WITHOUT PUG MILL



WITH OR WITHOUT PUG MILL.

This cut represents our Steam-Power Machine and Pug Mill combined. It is the strongest. It is the best It is the most simple. It is the most perfect. It does the best work. It works any clay. It does not get out of order. It is not liable to break down. It stands hard usage.

BETTER THAN EVER

Our machines are this season the Best ever built by our Mr. Henry Martin, whose thirty years' experience has rendered him familiar with the wants of the Trade.

For Strength, Durability, Qantity of Output and Quality of Work, they have no equal.

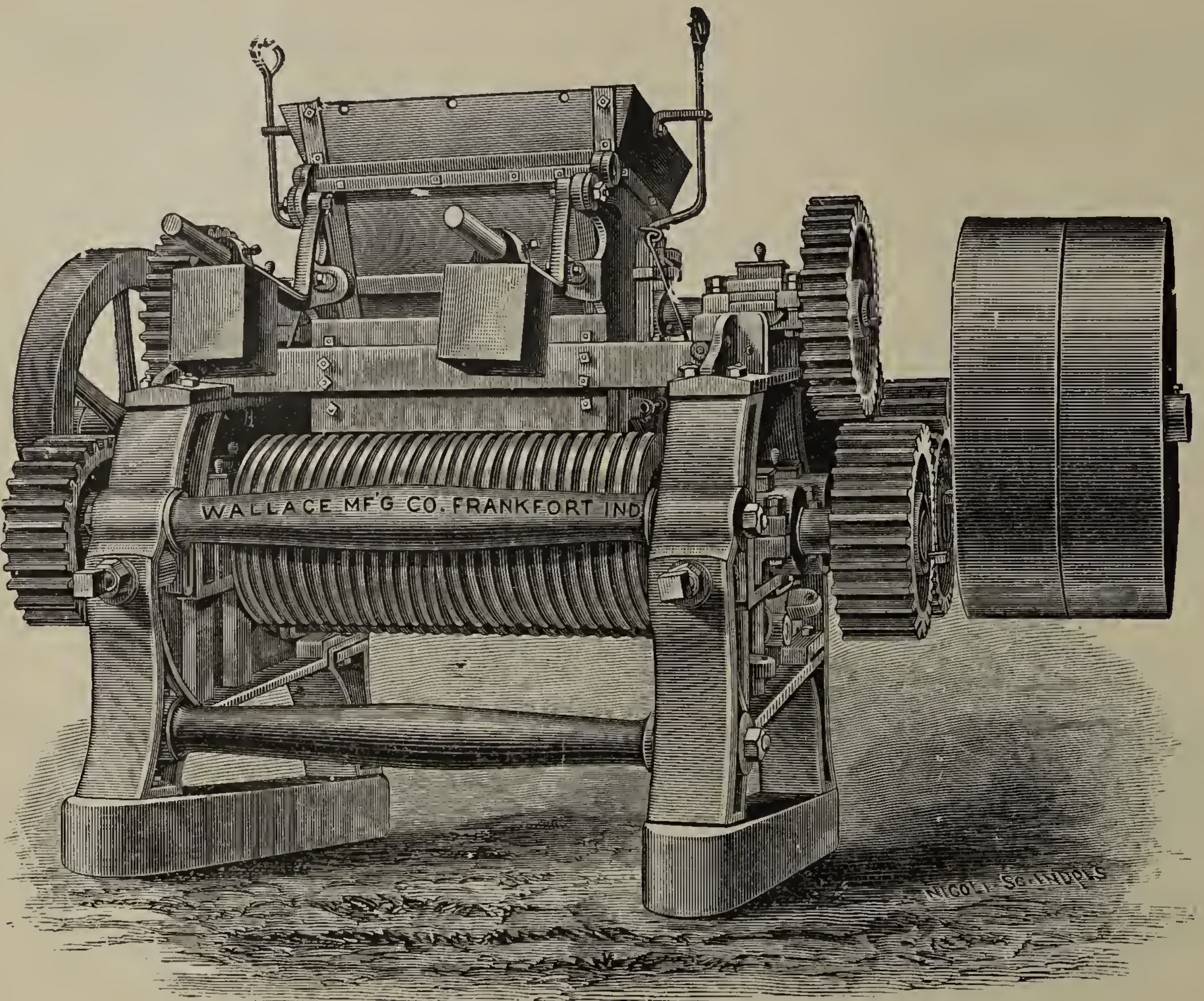
Brickmakers make no mistake when they buy the Henry Martin Machine.

—MANUFACTURED BY—

The Henry Martin Brick Machine Mfg. Co.,

Send for a Catalogue.

LANCASTER, PA., U. S. A

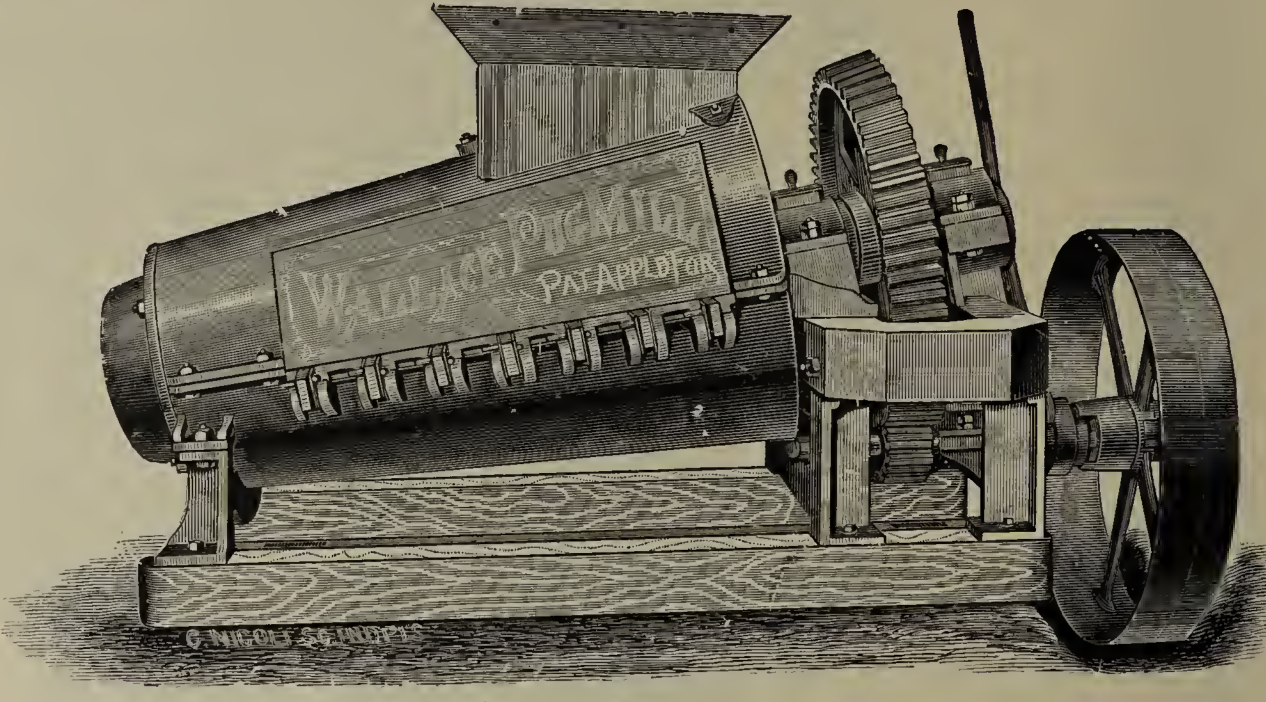

WALLACE MF'G CO. FRANKFORT IND.
NICOLI. SC. INDPLS

THE WALLACE No. 4," OR "JUMBO CLAY CRUSHER AND STONE SEPARATOR.

Largest size of our family of Clay Crushers.

We manufacture a full line of Clay-Workers' supplies.

Write and ask why we turned these cuts upside down, also particulars regarding our full line of Clay-Working Machinery.



WE MAKE TWO SIZES OF WALLACE PUG MILL—No. 1 AND No. 2.

WALLACE MANUFACTURING COMPANY,
LITTLE WONDER
BRICK MACHINE.
Frankfort, Ind.

25.000 CAPACITY.

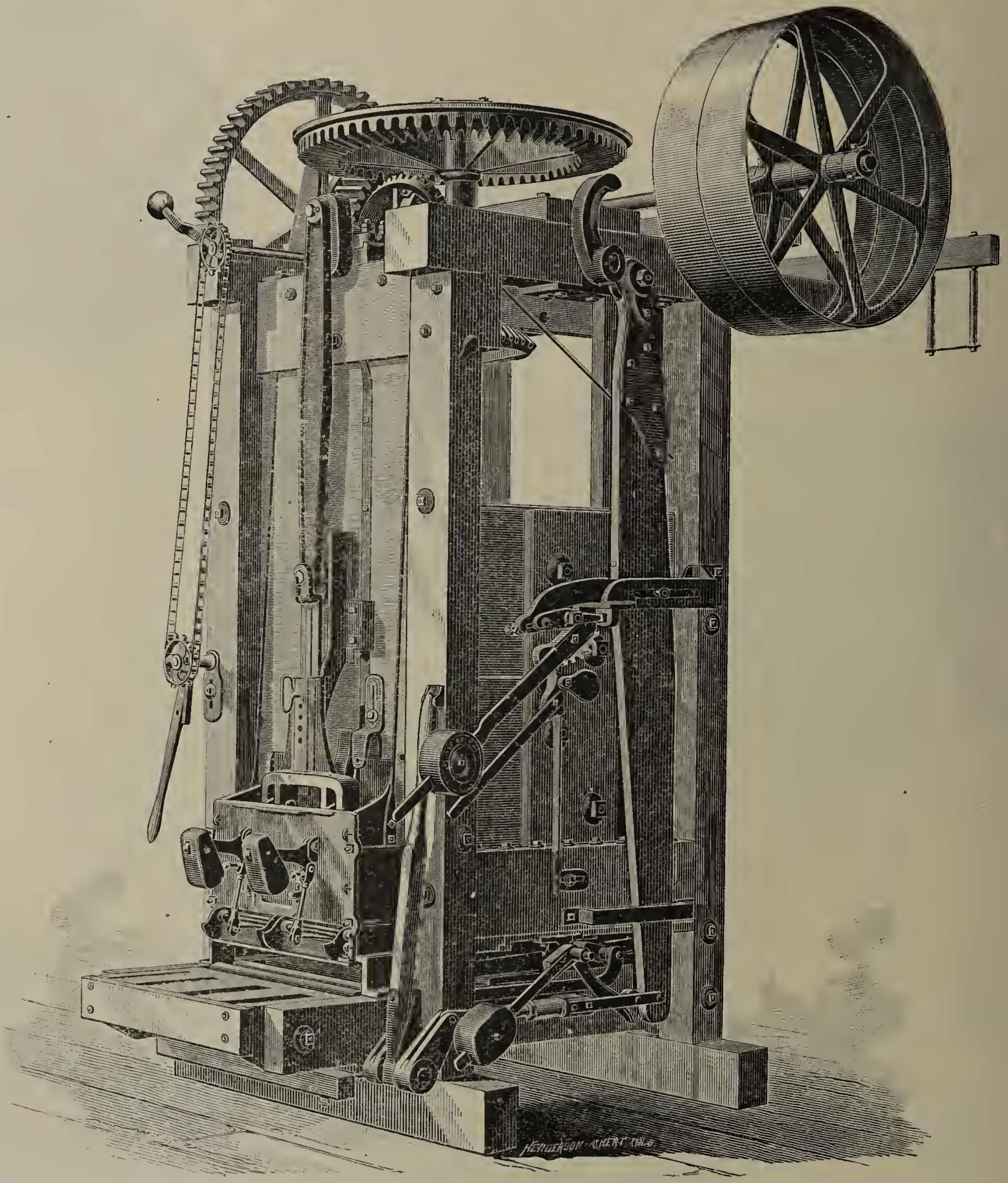
Big and Little Wonder with Automatic Cutting Tables.

WALLACE MANUFACTURING CO.,

(Mention Clay-Worker.)

FRANKFORT, INDIANA.

The "Tiffin" AUTOMATIC Brick Machine



The "Tiffin" **Automatic** Brick Machine is, **beyond question**, the best machine of its class in the market. It is **Heavy, Strong** and **Durable. IT IS GUARANTEED TO DO GOOD WORK.**

The **"TIFFIN"** is made for use by **Steam**, or **Horse** power. The capacity of the **Horse Power Machine** is 18,000 to 20,000 per day, and of the **Steam Power** 25,000 to 40,000 per day, according to the speed at which they are operated.

Both styles are equipped with our **Automatic "Stone Doors,"** which permits a stone, or any other hard substance, that may have passed in with the clay, to pass out **without breakage to the Machine.**

PRICES:	Steam Power Machine	$350.00
	Horse Power Machine	$250.00

The principal shafts are of Steel, and all other material used, is **First Class. Competent Workmen Only Employed** in their onstruction. These machines have been **Thoroughly Tested** in the hands of **Experienced Brickmakers** during the past season, and with the most **Satisfactory** results to them. Parties who may be **Interested Enough** to wish to make inquiry, will be given the names and address of the parties who have had them in use.

We are the makers of the **CELEBRATED "OLD RELIABLE"** Brick Machine, for use by hand power, which is so well and favorably known to the Brickmakers of the entire country. We are also manufacturers of Turn Tables, Trucks, Wheel Barrows Molds, Kiln Doors, Etc., Etc. Correspondence solicited.

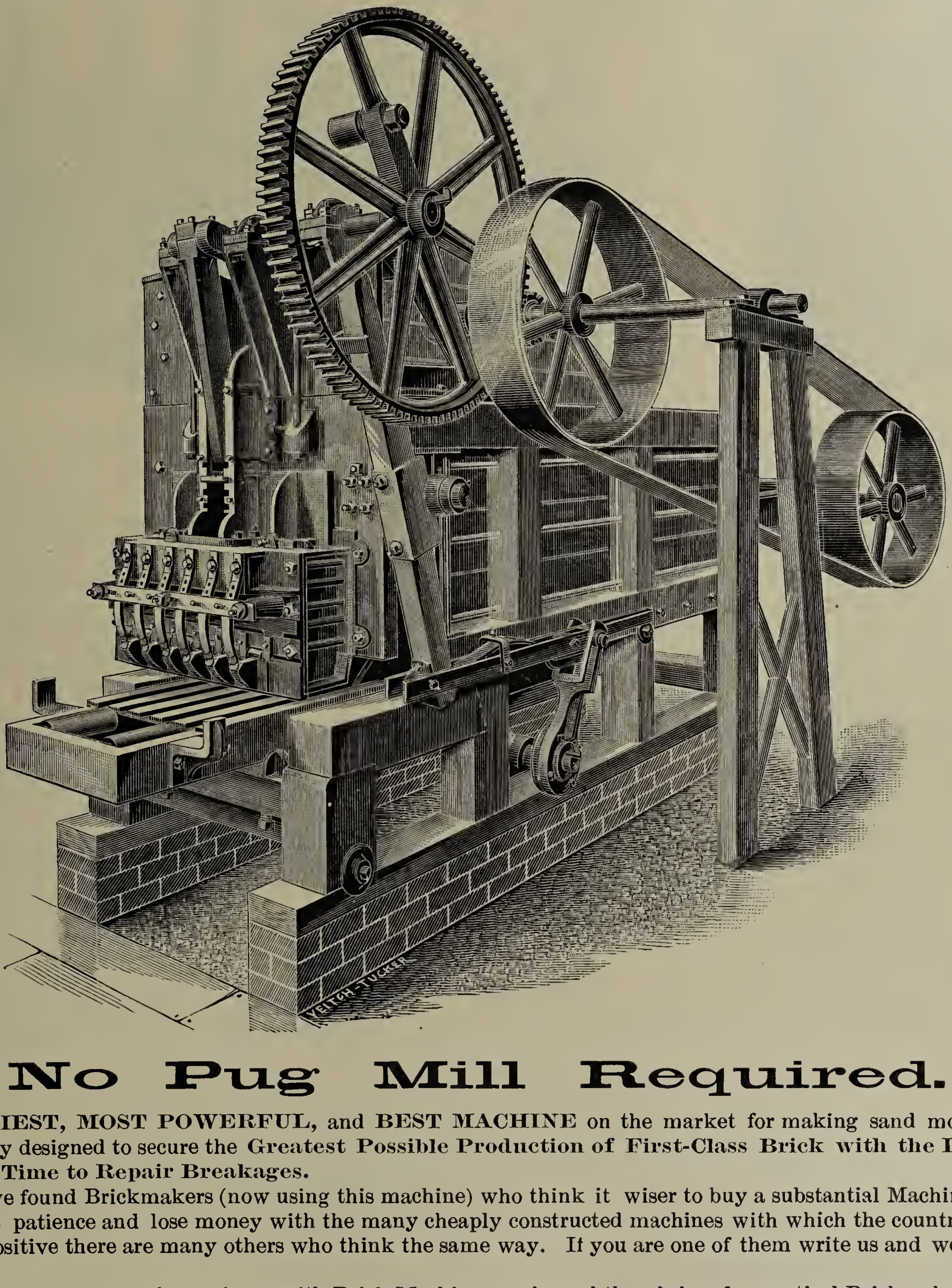
TIFFIN AGRICULTURAL WORKS,

[Mention the Clay-Worker.]

TIFFIN, OHIO.

THE "NEW HAVEN"

HORIZONTAL STEAM POWER BRICK MACHINE.



WEIGHS 12,000 POUNDS.

SIMPLE, STRONG, DURABLE.

No Pug Mill Required.

HEAVIEST, MOST POWERFUL, and **BEST MACHINE** on the market for making sand moulded brick being carefully designed to secure the **Greatest Possible Production of First-Class Brick with the Least Outlay and Loss of Time to Repair Breakages.**

We have found Brickmakers (now using this machine) who think it wiser to buy a substantial Machine than waste time, exhaust patience and lose money with the many cheaply constructed machines with which the country is flooded and we are positive there are many others who think the same way. If you are one of them write us and we will tell you all about it.

We believe our years of experience with Brick Machine repairs and the advice of a practical Brickmaker has enabled us to produce a Machine Superior to all.

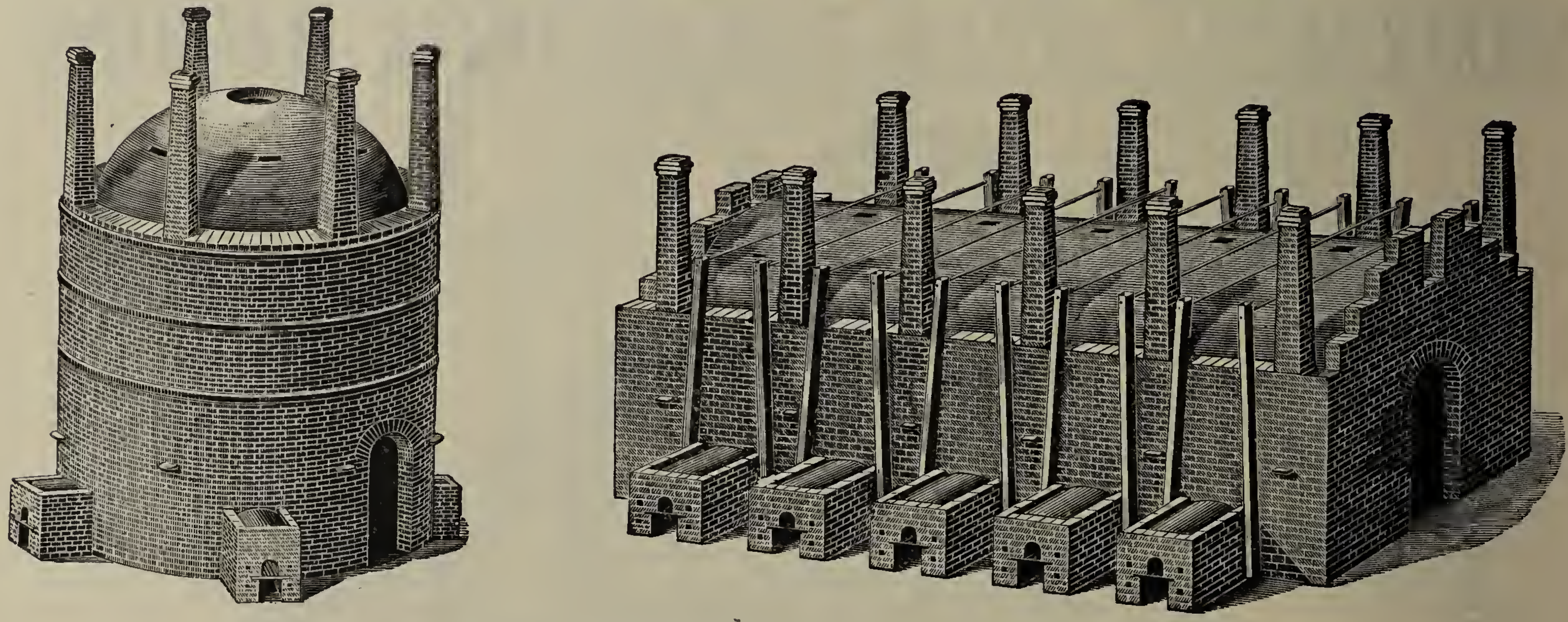
The McLagon Foundry Co.,

NEW HAVEN, CONN.

[Mention the Clay-Worker].

THE EUDALY KILN.

BURNS ANY KIND OF CLAY OR WARE



THE DOWN-DRAFT KILN.

UNIFORMITY IN BURNING is without a doubt the most essential feature to clay workers. Especially is this the case with fine clays where it is desired to have the wares of uniform color, size and hardness.

In the construction of these kilns particular attention has been paid to this point, by having first carefully examined the subject of drafts and the strength and nature of the different kinds of fuel. The size of the kiln, the size and number of furnaces, flues and chimneys must always sustain the proper relation to each other for a perfect draft. Too much draft is as dangerous as too little. One of the greatest mistakes of kiln inventors and builders is that they utterly disregard the important subject of drafts.

ABILITY TO DIRECT THE HEAT TO ANY PART OF THE KILN is equally as important as a proper draft. Unless the burner has control of the heat in the kiln he has no assurance of a uniform burn. In these kilns if the burner finds the wares too hot in any portion of the kiln he can in a moment shift the heat to any other part where it is not so hot, or what is better, if he has two or more kinds of wares in the kiln, one of which requires more burning than another, he can easily give that portion of the kiln an extra amount of heat. We claim that this is the only kiln in which these results can be attained successfully.

For this reason wares can be burned by this system **more uniformly** than by any other.

Practically there is no difference from top to bottom, yet this is purely a *down draft* kiln. There are no inside dampers or cut-offs. **Everything about the kiln is permanently built.**

ECONOMY OF FUEL AND LABOR is perhaps the second most important feature of any kiln. We hear a great deal said about "economy in fuel and labor," but to understand what is necessary to a fuel and labor saving kiln one should be thoroughly acquainted with all kinds of fuel and the conditions necessary to get the greatest number of heat units out of it, and at the same time **distribute the heat to the burning wares in the most effective manner.**

We claim that our latest improved furnace is the most **complete economizer** of fuel that has ever been invented.

The construction is purely scientific, and is made by first obtaining the chemical requisites necessary to insure perfect combustion and then building a furnace to bring about these results. Different kinds of fuel require a different size and construction of furnace. We use any kind of fuel, soft coal, screenings, oil, gas or wood.

COST OF CONSTRUCTION.—These kilns require no large stack, which ordinarily costs as much as the kiln proper. Many persons think they must have a large, tall stack in order to have sufficient draft to get the bottom of the kiln burned.

This is certainly a mistaken notion.

The things that are required, however, are a correct location and size of furnaces, flues and chimneys with reference to each other and the kiln. When these are properly attained the burner need have no fear about draft.

In these kilns great care has been taken to adjust these relations in such a way that the expensive stack is not at all required, and a much better draft obtained.

DURABILITY.—Each part of these kilns is built with special reference to strength and durability.

The furnaces, which are perhaps the most perishable parts of any kiln, are in these kilns made very strong and durable.

Those parts most liable to burn out can be easily removed and replaced without damage to the other parts of the furnace.

Rules are given by which a builder of these kilns can get the strongest crown and best supports to the kiln.

SIZES.—These kilns can be built either **round** or **square**, and of **any** desired **size.** A number of these kilns are now in use that burn from 150 to 250 thousand bricks at a time. The walls are built **twenty-four inches thick.** They should be lined throughout with fire-brick where the clay is very hard to burn. Good kilns can be made, however, without using fire-brick for any part except the **furnaces** and **bags.** In asking for cost of construction **state size of kiln in feet wanted,** whether the kiln walls, crown or bottom are any or all to be lined with fire-brick.

DRAWINGS and specifications for building kilns will be furnished any who purchase *kiln or yard rights.* We usually can urnish a man to superintend the building if desired.

For further information address

W. A. EUDALY,

64 Johnston's Building, - - - - CINCINNATI, OHIO.

MORRISON'S
IMPROVED KILN

FOR -:- BURNING -:- CLAY -:- WARES

Especially adapted to Burning Common, Repressed and Ornamental Brick.

PATENTED IN UNITED STATES AND CANADA.

SUCCESSFUL! DURABLE!

Daily product of our Kilns in the United States, One-Half Million Bricks. Our claims fully substantiated BY OUR PATRONS. We claim ninety to ninety-five per cent. hard brick. Arch bricks all Fronts and Pavers and none damaged—of uniform color. Pressed brick burned without fire-marks—coal screenings preferred for fuel. One fireman for two hundred thousand bricks. The

Only Kiln That Regulates the Temperature of Heat

And directs its course by a system of air drafts, giving complete control of the degree of heat, as well as its manipulation. This system we have covered by letters patent. Any persons using these air drafts are liable to prosecution for infringement.

Read the following testimonial from a recent patron, and another new one from an old patron:

R. B. Morrison, & Co., Rome, Ga.: Knoxville, Tenn., October 31st, 1888.

GENTLEMEN—I have used your *Improved Kilns* during the past twelve months and cheerfully report the result. We burn our bricks in your Kiln at a cost of sixty-five cents per thousand for fuel and labor; a saving to us, over our old method, of eighty cents per thousand on he two items. My saving in waste brick in the kiln and at the building is fully *ten per cent.*, or sixty cents per thousand in other words. Every time I burn your kiln of 300,000 bricks it is a saving to me of *more than four hundred dollars* over the old process. I find your kiln durable and simple to operate. We use coal screenings for fuel. Have no waste in arches, and burn ninety per cent. hard brick. I have no hesitation in pronouncing your kiln a success in every respect, as you make no claims it does not fulfill. Yours Truly,

REPS. JONES.

R. B. Morrison & Co., Rome, Ga.: Atlanta, Ga., July 20th, 1888.

GENTLEMEN—We have used your Improved Kilns for three years and during that time have burned upward of a hundred millions in them and wish to emphasize our former statement in regard to your kilns. They are reliable, durable, and the best kilns for our purpose, we have been able to find after investigating many of the various kilns in use, and say to our friends of the trade: If you want kilns that will burn your brick nearly all hard, and do it every time, burn them economically and without loss, and with little cost for repairs, secure he Morrison Kiln.

CHATTAHOOCHEE BRICK CO., per GEO. W. PARROT, Vice-Pres.

Royersford, Pa., (near Philadelphia) August 20, 1889.

Mr. E. Petts: DEAR SIR—In reply to your letter will state that our Morrison Kiln turned out O. K. It was the best kiln of brick we ever saw—*no waste and nearly all hard.*

A. T. KEELEY.

—WE SELL OUR KILN STRICTLY ON MERIT—

☛For descriptive circulars, ~~additional~~ testimonials, and all information desired, address

R. B. MORRISON & CO.,

Box 335, - - - - ROME, GEORGIA.

CHAMBERS BROTHERS CO.,

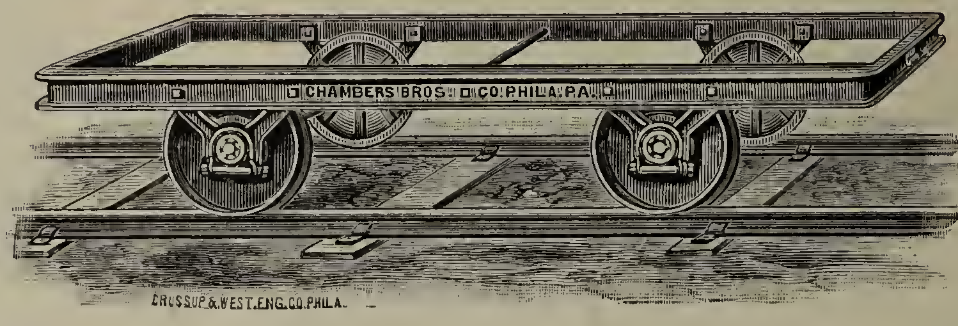
FIFTY-SECOND ST., BELOW LANCASTER AVE,

PHILADELPHIA, PA.

Improved Tunnel Dryers For Common Brick

And the Most Durable and Complete System for Transporting Green Brick.

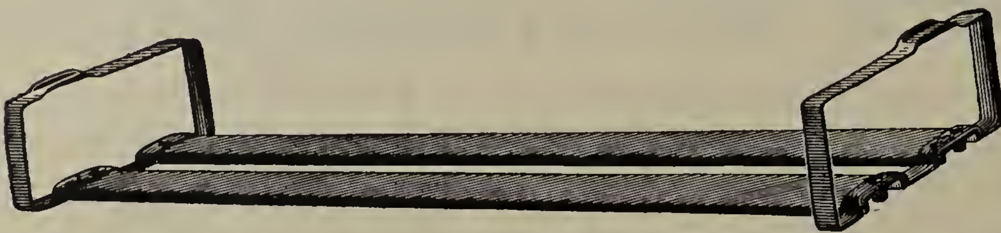
The Strongest Car Made.


CHAMBERS BROS. & CO. PHILA. PA.
CROSSCUP & WEST ENG. CO. PHILA.

The Strongest Car Made.

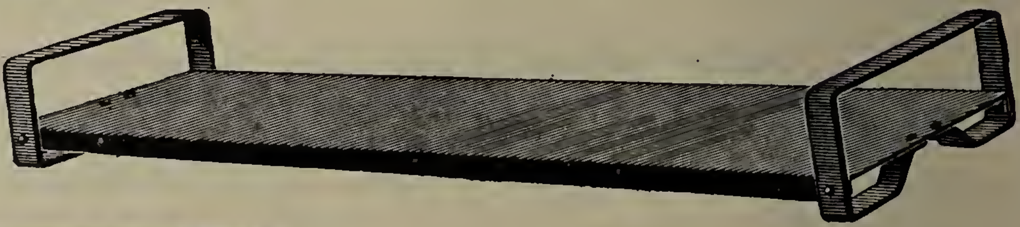
CHAMBERS' WROUGHT-BODY DRYER CAR.

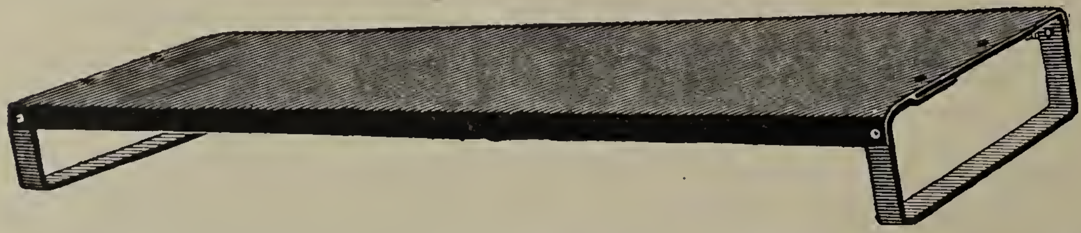
A lower priced Car with cast iron bodies made to order.



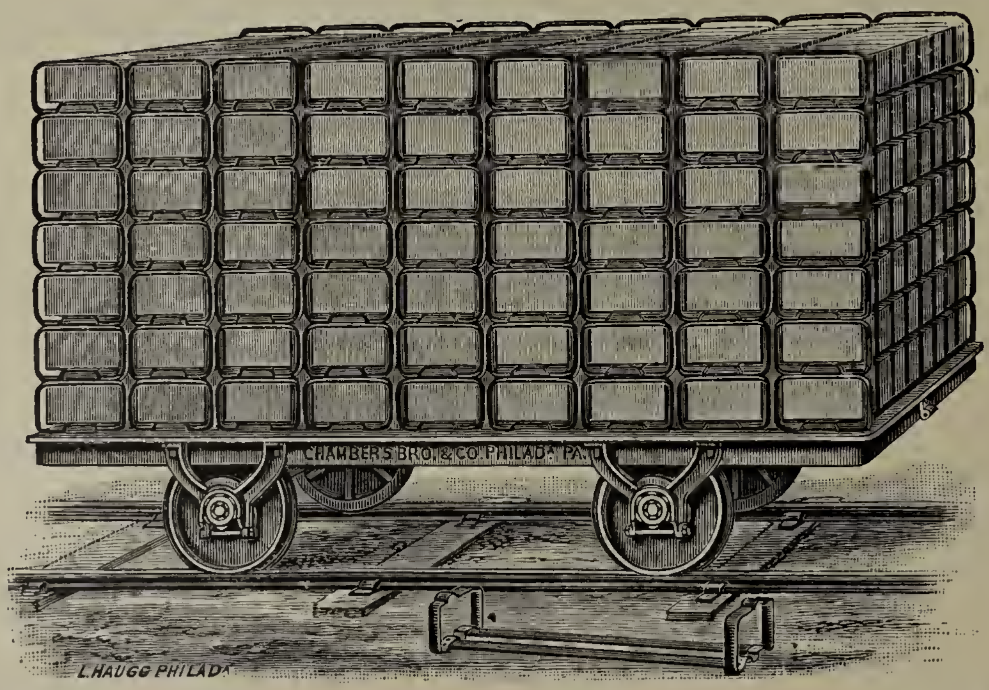
Wrought Iron Interlocking Pallet for Stiff Tempered Brick only.

Steel Pallet for brick placed on flat side or on edge.





Steel Pallet for soft moulded brick, or those placed on flat side only.


CHAMBERS BRO. & CO. PHILAD. PA.
L. HAUGG PHILAD.

CHAMBERS BROTHERS COMPANY,

PHILADELPHIA, - - PA.

See ad. on front cover page.

[Mention the Clay-Worker.]

CHANDLER SC. INDPLS.

THE CLAY WORKER

A JOURNAL DEVOTED TO ALL CLAY WORKING INTERESTS.
INCLUDING BRICK TILE TERRA-COTTA SEWER PIPE POTTERY ETC.

T. A. RANDALL & CO., PUBLISHERS.

Vol. XII, No. 6. INDIANAPOLIS, IND., DECEMBER, 1889. $1.00 a Year in Advance.

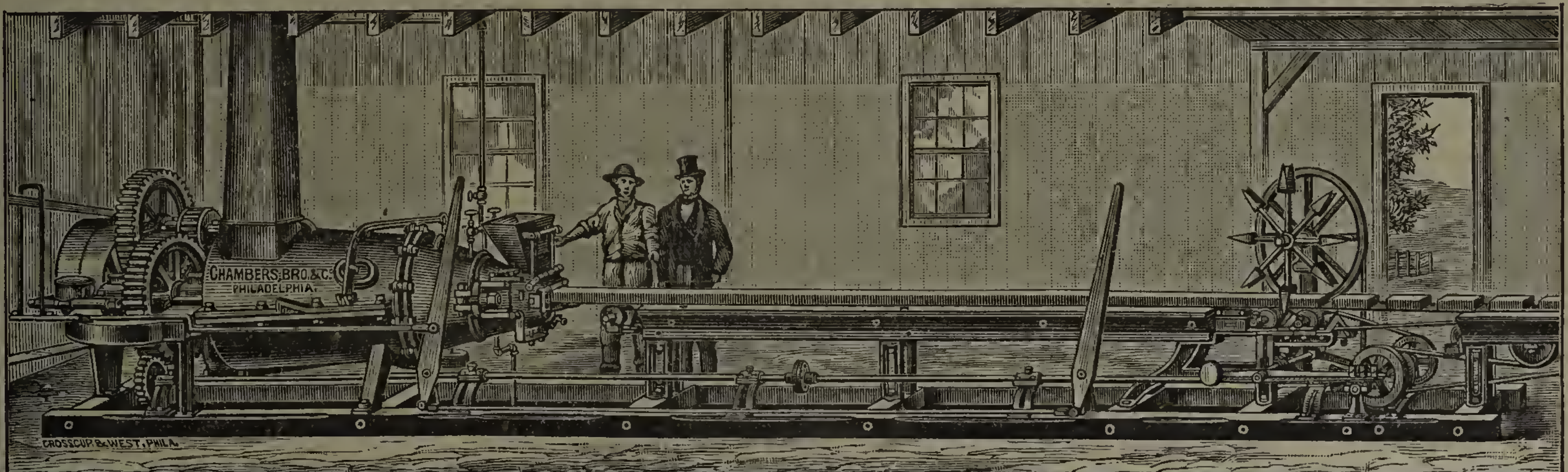
CHAMBERS BROTHERS COMPANY,

Fifty-second Street, below Lancaster Ave.,

PHILADELPHIA,

—MAKERS OF—

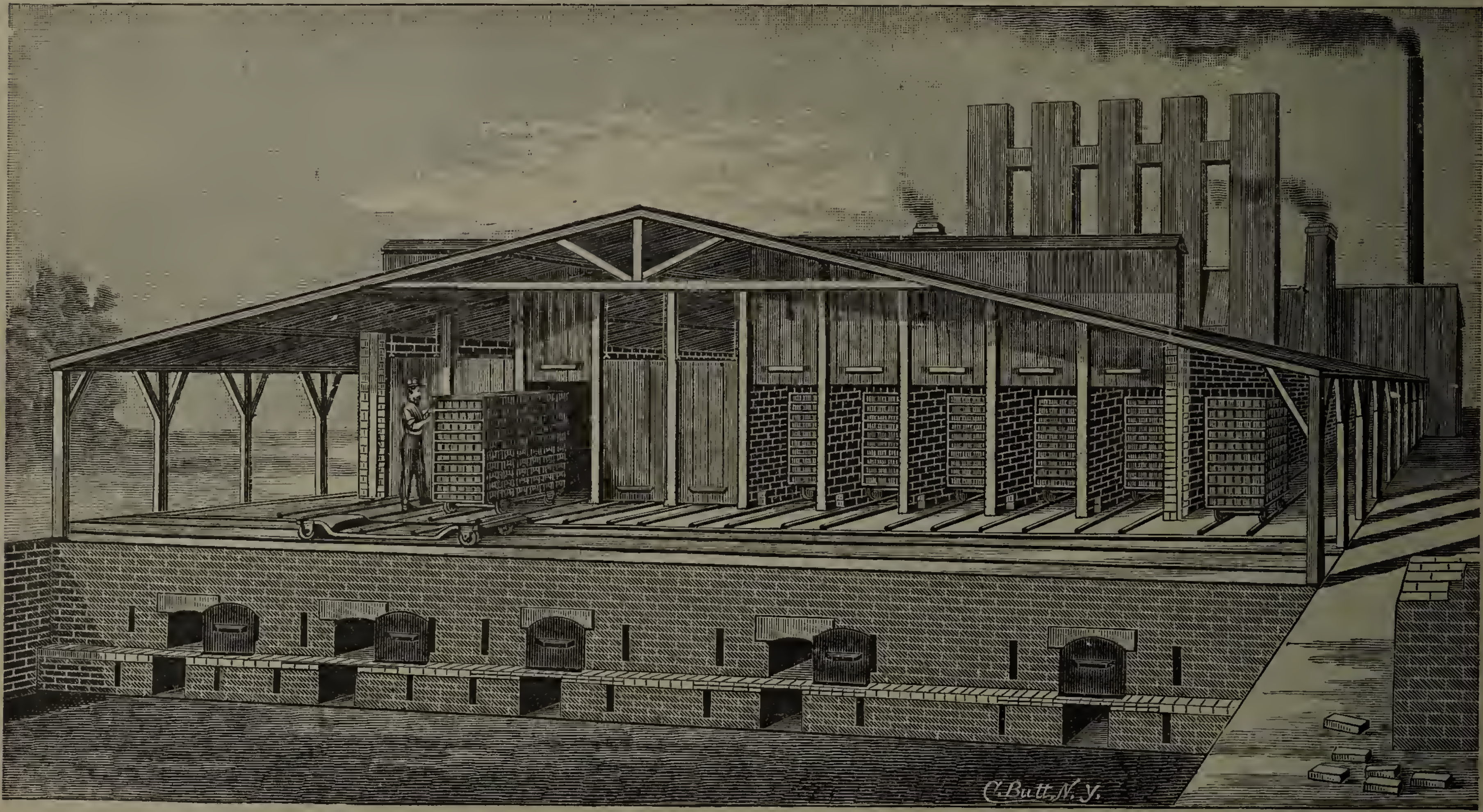
Improved * Brickmaking * Machinery.


CHAMBERS BRO & CO.
PHILADELPHIA.
CROSSCUP & WEST, PHILA.

Brick Machines of different sizes, making from 12,000 to 70,000 bricks per ten hours. Guaranteed to give satisfaction and furnished to responsible brickmakers on trial.

Clay Elevators, Stone-Extracting Crushing Rolls, Artificial Brick Dryers, Cars and Pallets and the EMENS CLAY GRANULATOR.

[See Ad. on page 450.]



SHARER'S PATENT

Calorific Kiln

FOR BURNING BRICK, TILE, ETC.

I respectfully invite attention to, and solicit careful examination of the many points of excellence combined in our IMPROVED KILN, for burning Brick, Drain Tile, Etc. They are now the STANDARD KILNS OF AMERICA, known as the CALORIFIC KILN. These Kilns are now in use in nearly every State and Territory in the United States and in Canada. They are SUPERIOR TO AND LESS EXPENSIVE than any other kiln now in use. Are Reliable and Durable, and any man of ordinary intelligence can operate them. Their construction and process of burning is such as to preserve SOUND AND SOLID ARCH BRICK; scarcely discernible as arch brick by those most familiar with brick, and suitable for any work where the best of brick are required and enables the operator to utilize any refuse fuel with the best of results.

No better fuel than coal-slack being required—one ton of which is equivalent to two cords of wood burned by the old process. The cost of LABOR AND FUEL is one half less than by the old process. Obtaining an increased average value of the products. Producing a MERCHANTABLE BRICK OR TILE OF EVERY ONE SET IN KILN. Effecting a saving of all the usual waste, unavoidable by the old and VERY CRUDE METHODS used for burning brick or tile. There being no bats, wedge-shaped blackened brick or tile in arches; and but few Salmon brick or tile—95 to 98 per cent. being Hard or Lined brick, of UNIFORM COLOR AND SIZE, and of better metallic ring and much stronger than those burned by the old laborious and uncertain manner.

ONE MAN, on a turn, will burn a kiln of 300,000 brick with greater ease than FOUR MEN will by the old process. Contractors and builders will pay more for brick burned in our Kiln, as they can well afford to do, because there is no waste and their men will lay up several hundred more per day, there being no time lost in sorting or slushing up around bats or ill-shaped arch brick, and no loss of time by shattered bricks breaking to pieces in attempting to cut them. This is apparent to any one, and will appeal to the good judgment of all.

Parties having any apprehensions or fears of the merits of these Kilns can arrange to have a man to superintend the construction and burning of one or more kilns by stipulating to pay his expenses and entering into conditional contract about the Right to use them.

☛ References and all information given on application by letter.

SHARER'S IMPROVED

Drying Kiln.

I desire to call attention to my improved method of drying Brick, Tile, Etc. Clay-workers, and especially Brickmakers have long felt the want of some means of Drying whereby they could avoid loss by storms, and loss of time by working in wet or dry weather, and prolong the season by working later in the fall and earlier in the spring, or all the year if necessary. This want is fully overcome by the use of my IMPROVED DRYING KILN. It has been thoroughly tested and has proven a complete success.

This Dryer requires but little room and is cemparatively inexpensive; will last a life-time, and reduces the business to a system and gives the manufacturer control of his business. It is adapted to the largest as well as the smallest works—to hand or machine made brick.

Some of the Advantages Arising from the Use of the Dryer.

1. It enables the manufacturer to dry brick EVERY DAY, as fast as made without regard to the weather, and enables him to sell for future delivery, and KNOW ASSUREDLY that he will have them ready for delivery when called for, and also enables him to run his works TEN OR TWELVE MONTHS of the year; instead of five or six months, as is usually the case.
2. It saves a large amount of labor required by the old method of wheeling to sheds or yards; edging, haking, and afterward wheeling from hake to kiln to be set. NOT A TRUCK OR WHEELBARROW NEEDED.
3. NO LOSS OR DAMAGED BRICKS BY STORMS OR FROST.
4. It saves the labor and expense of making extensive yards or sheds, and keeping them in repair. The room required for a Dryer is only a small fraction of what is required by the old methods. A space 100x75 feet is sufficient for a Dryer with a daily capacity of 60,000 brick.
5. As no bricks are lost by storms or frosts, or pitted or washed by sudden showers, no time lost by wet days, or soft yards after the rain is over, its advantages will be readily appreciated.

One other advantage, which, although the last I mention, is BY NO MEANS THE LEAST—that is PEACE OF MIND AND REST to the manufacturer.

All unset brick being under a tight roof, secure from rain or storms, the mind is freed from annoying apprehensions of damage or destruction of his property.

GEORGE W. SHARER, Proprietor,

8 South Broad Street, Room No. 1.

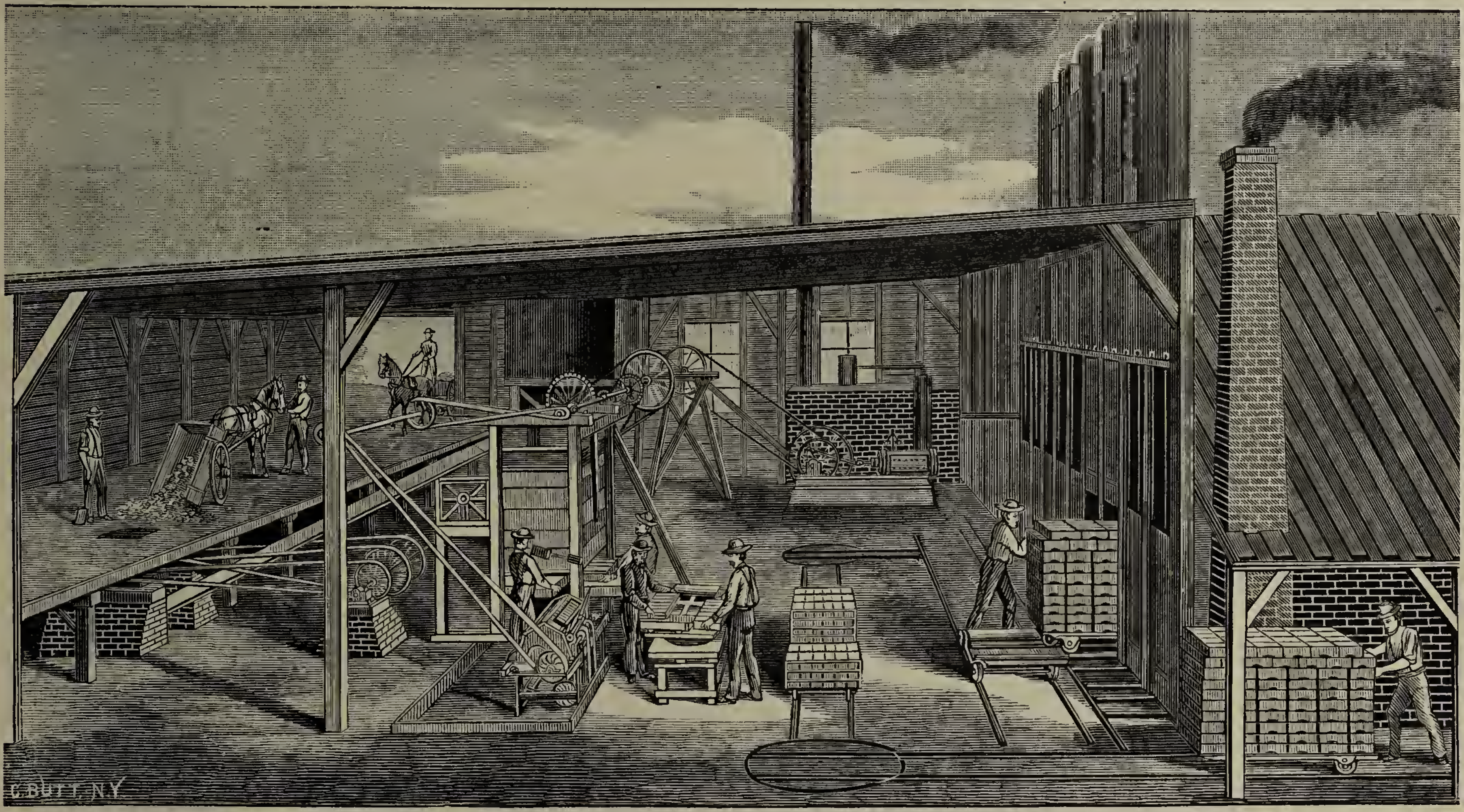
PHILADELPHIA, PA.

ED. H. CALLAWAY, Gen'l Agt., 72 Reade St., New York.
E. A. KING, Special Agt. New England States, 48 Congress St., Boston, Mass.
HUGH CAMERON, Toronto, Ont., Special Agt. Dominion of Canada.

SHARER'S IMPROVED DRYER

More than one hundred now in use **DRYING SUCCESSFULLY** Soft Mud Brick, Stiff Mud Brick, Pressed Brick, Fire Brick, Hollow Brick, Tile, Plaster, Architectural Terra Cotta, Terra Cotta Lumber, Peat and Lumber.

No other Dryer in existence can successfully dry such a variety of Materials.



27 have been built the present season and are now in successful operation.

The Only Successful Soft Mud Brick Dryer in Existence.

Will also dry Stiff Mud, Semi-Dry and Pressed Bricks at 50 per cent. less cost than any Steam Drier.

No other Dryer will Guarantee to dry Soft Mud Brick. I Guarantee to dry any kind of Bricks.

It is not a Direct Heat Dryer, nor a Steam Heat Dryer. It is a Radiated Heat Dryer. The heat being produced from Coal, Wood, Coke, Oil, Gas or any kind of Fuel, and Radiated through Brick or Metal floor. The heat can be so graduated as to successfully dry the most Tender or Refractory Clays without damage. While in a Direct Heat Drier the product of combustion coming directly in contact with the material to be dried will warp, check and crack in most cases. In a Steam Drier the heat cannot be graduated. Neither can heat be produced from Steam near as cheaply as from the Fuel Direct. With a Steam Dryer it is necessary to run one or more Boilers and Exhaust Fans day and night. There is No Machinery whatever necessary to operate my Dryer. Hence the wear and tear and expense of operating is reduced to the minimum.

References and all information given by letter or otherwise. Address,

GEO. W. SHARER, Proprietor,

8 South Broad Street, Room No. 1,

PHILADELPHIA, PA.

ED. H. CALLAWAY, Gen'l Agent, 72 Reade St., New York.
E. A. KING, Special Agent, New England States, 48 Congress St., Boston, Mass.
HUGH CAMERON, Toronto, Ont., Special Agt. Dominion of Canada.

READ TESTIMONIALS ON NEXT PAGE.

❀ ❀ TESTIMONIAL LETTERS. ❀ ❀

Office of G. B. Parker, P. O. Box 233,
Augusta, Ga., Nov. 12, 1889.
Mr. Geo. W. Sharer, Philadelphia, Pa.:

Dear Sir—It affords us much pleasure to endorse the Dryer you built for me several years ago. I have derived so much benefit from it since it was built that I really do not see how I could make brick without it. We run winter and summer; no stopping unless it is raining too hard to get our clay. We have no trouble getting 25,000 thoroughly dried brick out of it every day. We have been running it nearly four years and have had no repairs of any consequence to make, up to the present time. I have been making brick for fifteen years and never purchased anything in that line that gave me such entire satisfaction as the Brick Dryer. I see in the several brick journals advertisements of different Dryers, but I do not see how it is possible to improve on the one I have so far as results in drying is concerned. I have never had anyone to investigate its workings thoroughly that was not fully convinced it was a perfect success. Without the Dryer, rather than go back to the old way of drying, I think I would quit the business. I will be glad to have anyone interested in making brick call at my works at any time and make a thorough investigation for himself. Wishing you much success, I am,

Yours Truly, Geo. B. Parker.

J. J. Booth. Wm. Flinn.
BOOTH & FLINN, CONTRACTORS,
Office 933 Penn. Ave.,
Pittsburgh, Pa., Nov. 13, 1889.
Ed. H. Callaway, Gen'l Agent Sharer's Dryer, 72 Reade Street, New York:

Dear Sir—In reply to your inquiry regarding the Sharer Dryer you built for us last spring, we will say that it has proven entirely satisfactory and is all you claim for it and as we are now building three (3) more of your Dryers, with a total capacity of 100,000 per day, we deem this sufficient evidence of our faith in the Sharer Dryer. We cheerfully recommend it to anyone wanting a first class and reliable brick dryer. We are also well pleased with the three (3) Sharers Improved Calorific Kilns that we are now using.

Yours Truly, Booth & Flinn.

Office of Sayre & Fisher Co.,
ADAMANTINE BRICK WORKS,
Sayreville, N. J., Nov. 8, 1889.
Geo. W. Sharer, Esq., Philadelphia, Pa.:

Dear Sir—We have given your Dryer a thorough trial and can cheerfully recommend it to any brickmaker. We find it dries our fire and front brick cheaper and better than the open air, without warping or cracking. In fact, it does just as you guaranteed it to do. Yours Truly, Sayre & Fisher Co.,
E. A. Fisher, Sec'y.

OGDEN BRICK WORKS,
Bevier St. Walter P. Pratt, Man.
Office, Room 5 McNamera Bldg.,
Binghamton, N. Y., Nov. 8, 1889.
Mr. Ed. H. Callaway, New York:

Dear Sir—Yours of recent date regarding our opinion of the Sharer Improved Brick Dryer which you built for us last year received, and in reply would say that it has proven itself *invaluable* as it has increased our output from 2,500,000 to 4,000,000 brick annually with the one machine, and without any other expense in enlarging our plant. I would not consider a brickyard complete now, without a Sharer Dryer, and intend to increase the capacity of ours.

Yours Very Truly, W. P. Pratt,
Manager Ogden Brick Works.

PERTH AMBOY TERRA-COTTA CO.,
Perth Amboy, N. J., Aug. 1st, 1888.
Mr. Geo. W. Sharer, Philadelphia, Pa.:

Dear Sir—The Driers which you constructed for us are giving perfect satisfaction and we could not be induced to return to the old method of drying. Yours Truly,
Perth Amboy Terra-Cotta Co.,
W. C. Hall, Gen'l Man.

Office of Duhl, Schaple & Co.,
BRICK MANUFACTURERS,
Elmira, N. Y., Nov. 1st, 1889.
Ed. H. Callaway, Esq., New York:

Dear Sir—The Sharer Dryer which you built for Duhl, Schaple & Co. last year, I am pleased to say, gives perfect satisfaction and does all you claimed it would do and in fact, is *the* Dryer. We have so far, made about 5 millions of brick this season and are still running. Yours Truly, Louis Duhl.

Fred A. Lincoln, Pres. Henry W. King.
20 Grafton St. P. O. Block.
BROOKFIELD BRICK CO.,
Worcester, Mass., Nov. 11, 1889.
Geo. W. Sharer, Esq., Philadelphia, Pa.:

Dear Sir—In answer to your inquiry how our Dryer is getting along, we beg to say: You put in an eight tunnel Dryer for us three years ago about this time. Owing to the inexperience of the man you sent to erect it, we failed to obtain satisfactory results. Last spring you added two more tunnels and corrected mistakes in former construction, and since the first of April, the reports of our foreman show that we have made and dried over four and one-half millions of brick in a most satisfactory manner. It is now being run regularly, and we shall run it all winter. We dried brick with it last winter with the thermometer 30 degrees below zero. We wish to add that no one could treat us with more courtesy or more honorably than you have done. Very Truly Yours,
Brookfield Brick Co.

Office of the Paragon Plaster Co.,
Syracuse, N. Y., Nov. 9, 1889.
Ed. H. Callaway, Esq, New York:

Dear Sir—The Paragon Plaster Co. spent a great deal of time investigating Dryers. After looking the field over thoroughly and investigating nearly every Dryer in the country, they decided to try the "Sharer." We are more than pleased with it and would say the capacity is greater than was represented to us. We cheerfully recommend it to any one in want of a Dryer. Yours Truly,
Paragon Plaster Co.,
Jacob Amos, Pres.

Office of Benjamin F. Orton,
Room 1, No. 8 South Broad Street,
Philadelphia, Pa., Nov. 18, 1889.
Mr. Geo. W. Sharer:

Dear Sir—I am using at my brick works at Bustleton, Pa., three (3) of your patent burning kilns and a ten tunnel Dryer, and I take great pleasure in saying that they give perfect satisfaction. I investigated the matter of drying brick thoroughly before I concluded to put in your Dryer, and I could find no successful Dryer in use for soft mud brick but yours. Yours Truly, B. F. Orton.

Works, Maurers, N.J. Office E. 23d St., N.Y.
HENRY MAURER & SON,
Proprietors of the
Excelsior Fire Brick and Clay Retort Works
New York, Nov. 19, 1889.
Geo. W. Sharer, Esq., Philadelphia, Pa.:

Dear Sir—We are pleased to add our name to your long list of testimonials as to the merits of your Improved Brick Dryer. We have used it for several years past and it has given us entire satisfaction, doing the work of drying our fire brick, etc., admirably and for which we cheerfully recommend it to all who may have use for such.

Yours Truly, Henry Maurer & Son.

Office of D. Charles Murtha,
BRICK MANUFACTURER,
Germantown Ave., above Broad St.,
Philadelphia, Pa.. Nov. 19, 1889.
Mr. Geo. W. Sharer:

Dear Sir—I received your letter of the 6th inst. asking how we were pleased with your Dryer and Kiln. In reply would say that it gives me great satisfaction to testify to their good qualities. We have been using your Dryer for the past four (4) months, and it has given entire satisfaction, drying 30,000 soft mud bricks every day. It not only enables us to dry brick every day without regard to the weather, but it enables us to sell for future delivery, knowing assuredly that we will have them ready when called for, and besides the amount saved in handling over the old method, we have no washed or storm beaten brick, which are becoming so objectionable that the best builders will not use them, and are able to run ten (10) months in the year instead of six (6). In fact, your Dryer is indispensable to the success of any well conducted brick concern. Your kiln I burned twice with excellent results, being cherry red from top to bottom. No man could ask for anything better. Wishing you much success with your business, I remain,

Yours Truly, D. Charles Murtha.

GEO. W. SHARER,

South Broad St., Room No. 1. PHILADELPHIA, PA.

(Read preceding pages.)

Improved Eureka Dry Press Brick Machine.

WEIGHT SEVENTEEN TONS.

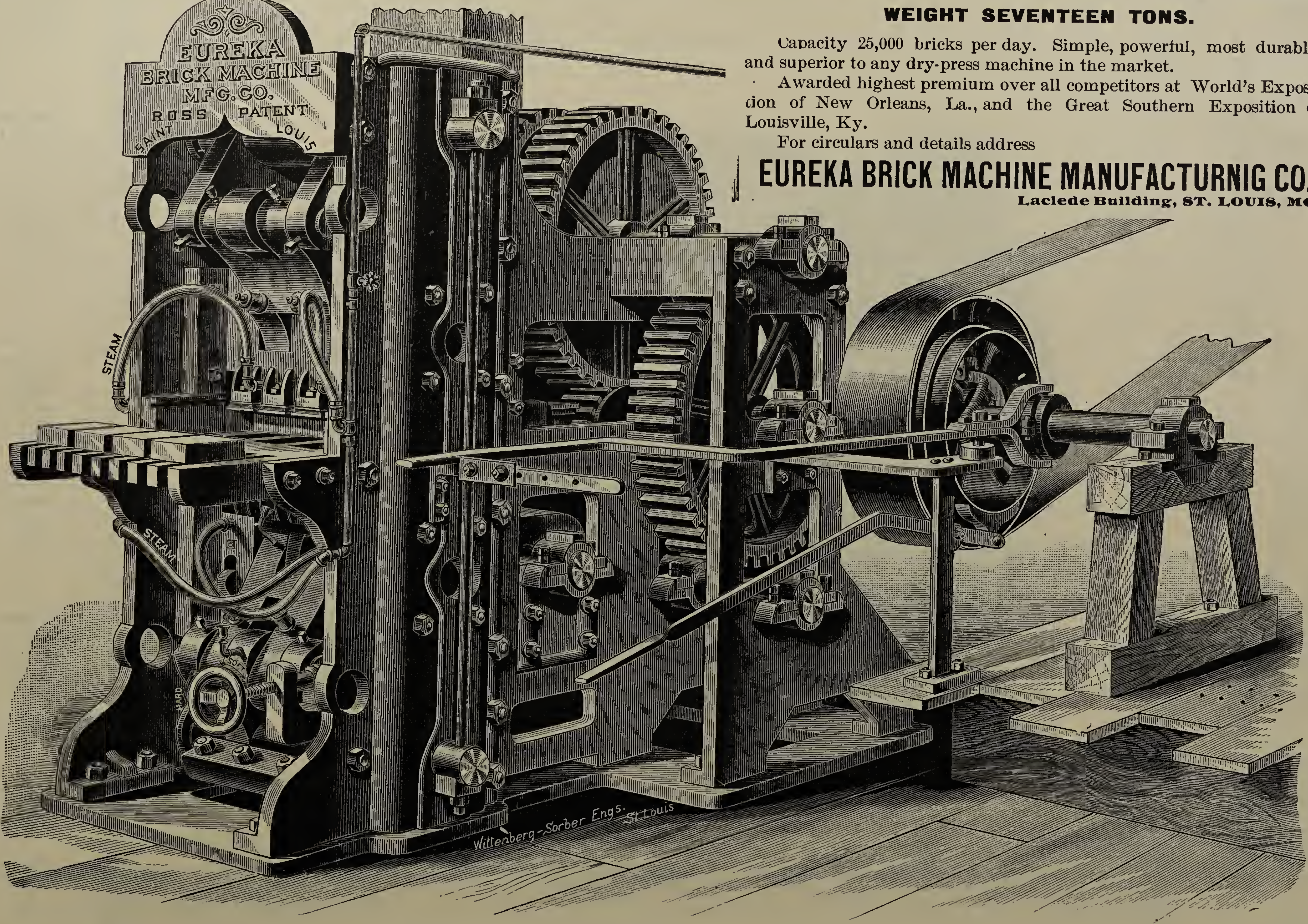
Capacity 25,000 bricks per day. Simple, powerful, most durable, and superior to any dry-press machine in the market.

Awarded highest premium over all competitors at World's Exposition of New Orleans, La., and the Great Southern Exposition of Louisville, Ky.

For circulars and details address

EUREKA BRICK MACHINE MANUFACTURNIG CO.

Laclede Building, ST. LOUIS, MO.

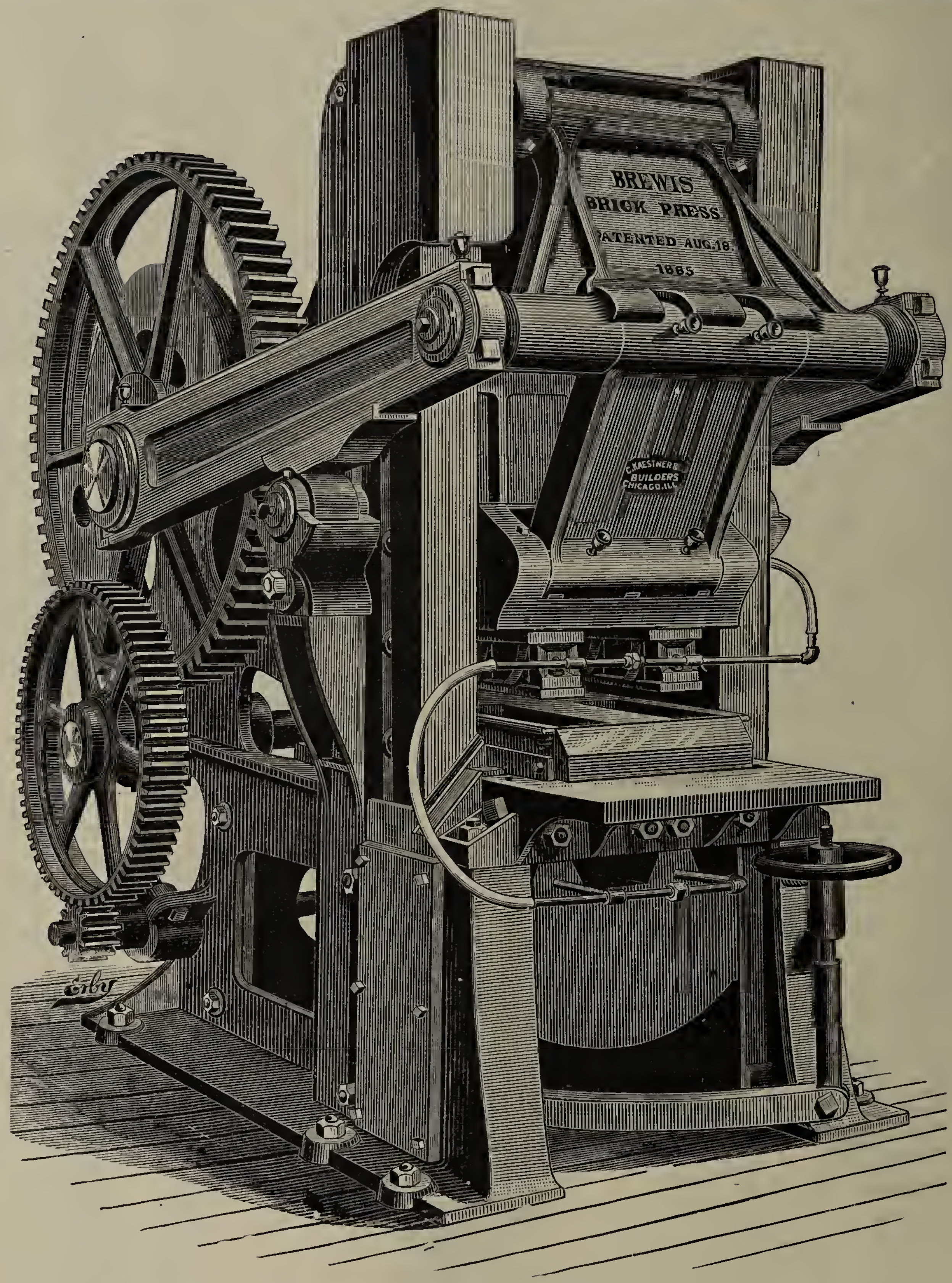


The Brewis Patented Brick Press.

SIMPLE AND DURABLE.

Guaranteed to make as many Perfect Brick per mould as can be made on any machine now in the market. We except none.

Fully covered by patents. **We protect our purchasers**



Capacity 8,000 to 16,000 a day depending upon the clay

Shipped to responsible parties on 30 to 60 days trial.

Guaranteed against breakage for Two Years.

We furnish the Boyd and Raymond Pulverizers at prices that defy competition. Send for Circulars and Prices to

CHARLES KAESTNER & CO., Machinists and Founders,

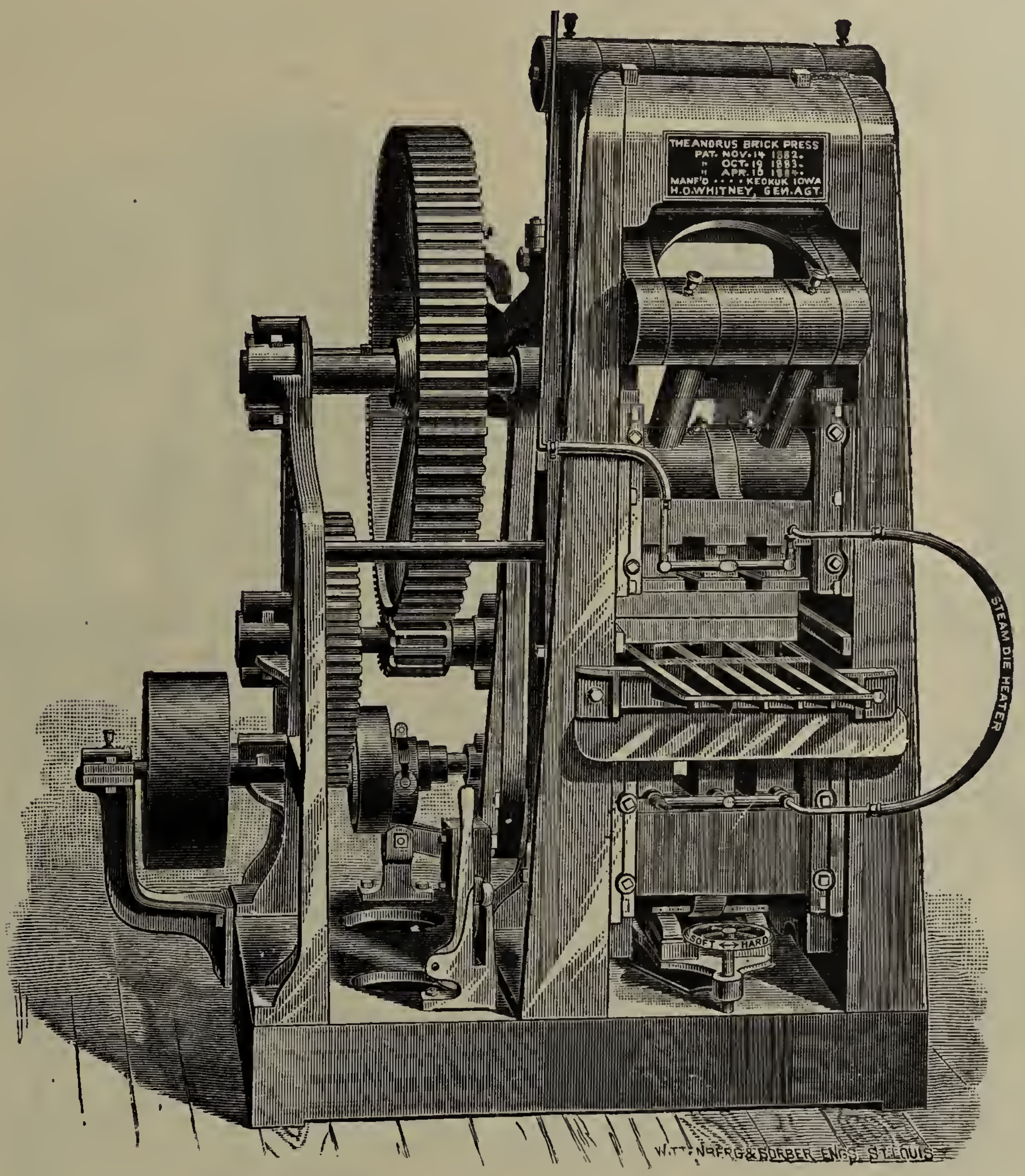
ENGINES, BOILERS, PUMPS, SHAFTING, PULLEYS, HANGERS, ETC.,

[Mention the Clay-Worker.] **303-311 South Canal Street, CHICAGO, ILL.**

—THE—

Improved Andrus Double Pressure Brick Press.

UNRVALLED FOR SIMPLICITY, POWER AND DURABILITY.



Our new **4 Mould Machine** has a capacity for 25,000 pressed bricks per day. We build at our own Factory Two, Three and Four-mould Machines which we guarantee in every particular.

For terms, etc., address

H. O. WHITNEY, Gen'l Agent,

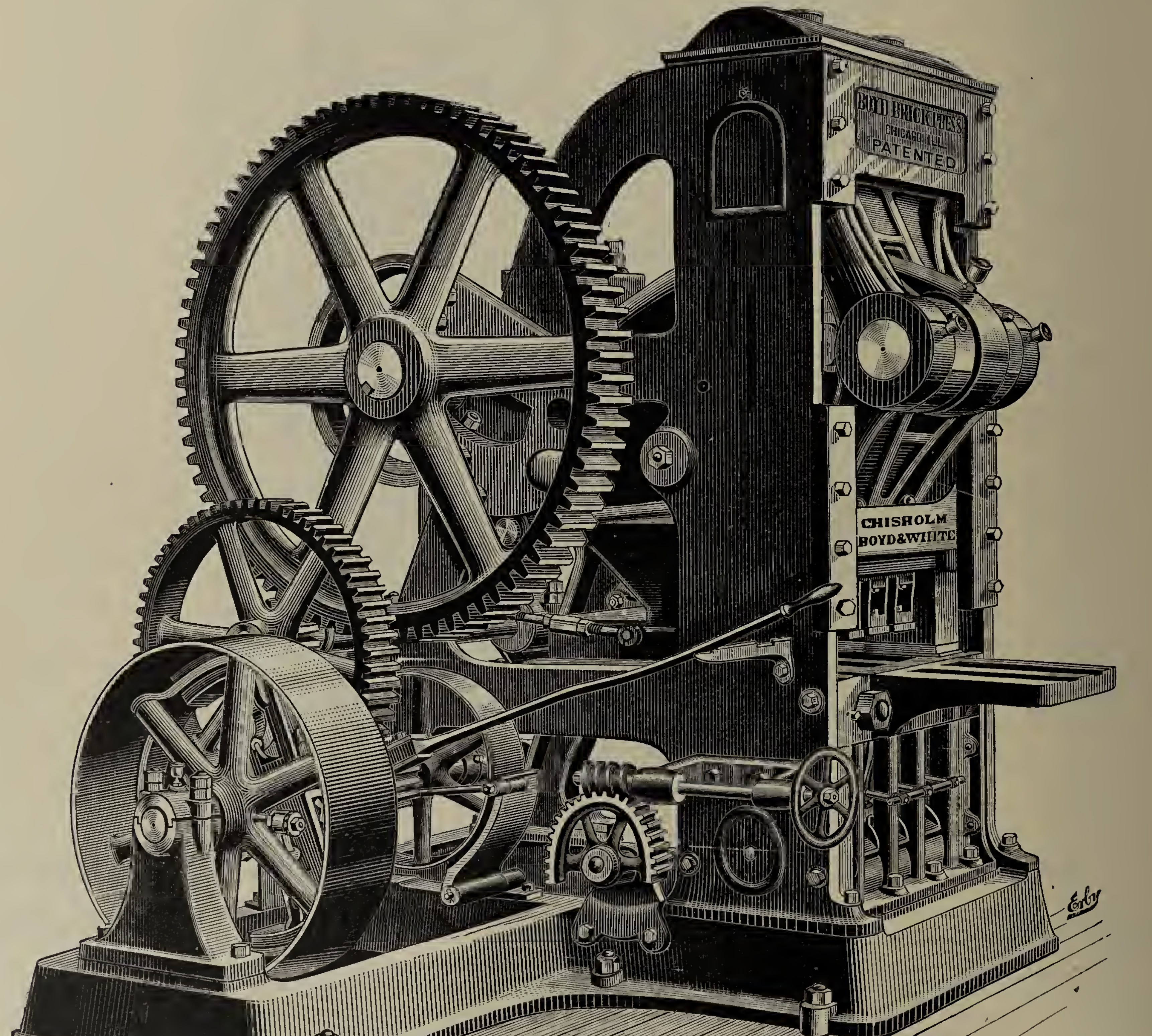
General Office and Factory, KEOKUK, IA. (Mention the Clay-Worker.) KEOKUK, IOWA.

THE BOYD BRICK PRESS

Will be furnished on trial to make 500,000 brick, before acceptance if desired.

A Wonderful Record, 21 Presses sent out on trial this season and all were accepted.

ROYALTY, RENTAL OR PURCHASE.



CHISHOLM, BOYD & WHITE,

Office, 93, 94 & 95, Adams Express Building, [Mention the Clay-Worker.] CHICAGO, ILL.

A Wonderful Record.

TO THE PUBLIC:

The BOYD BRICK PRESSES have made a record for us of which we are justly proud. We have placed twenty-one (21) of our Standard 3-Mold Presses this season, all of which have been running regularly, giving absolute satisfaction, each making from 15,000 to 20,000 dry-pressed brick per day, and in many cases using clay direct from the bank.

Responsible parties furnished a Boyd Brick Press on trial on which to make 500,000 brick, if desired, before acceptance. We will also furnish this Press on Royalty, Rental or Purchase, and on the most liberal terms.

The BOYD BRICK PRESSES cannot be broken in pressing clay. Each is built to resist a pressure of 400 tons on each brick before rupture at its weakest point. The power to drive varies from two to three H. P. per mold on different clays.

The semi-dry process of making brick for all purposes is the cheapest and the best. We invariably send a competent man to start each Press, who is also competent to prepare the clay and burn the brick if necessary, so that failure is absolutely impossible.

CHISHOLM, BOYD & WHITE,

A. D., 1889. CHICAGO.

St. Louis Iron and Machine Works, Iron Founders and Builders of Heavy Machinery.

ESTABLISHED 1854.
INCORPORATED 1875.

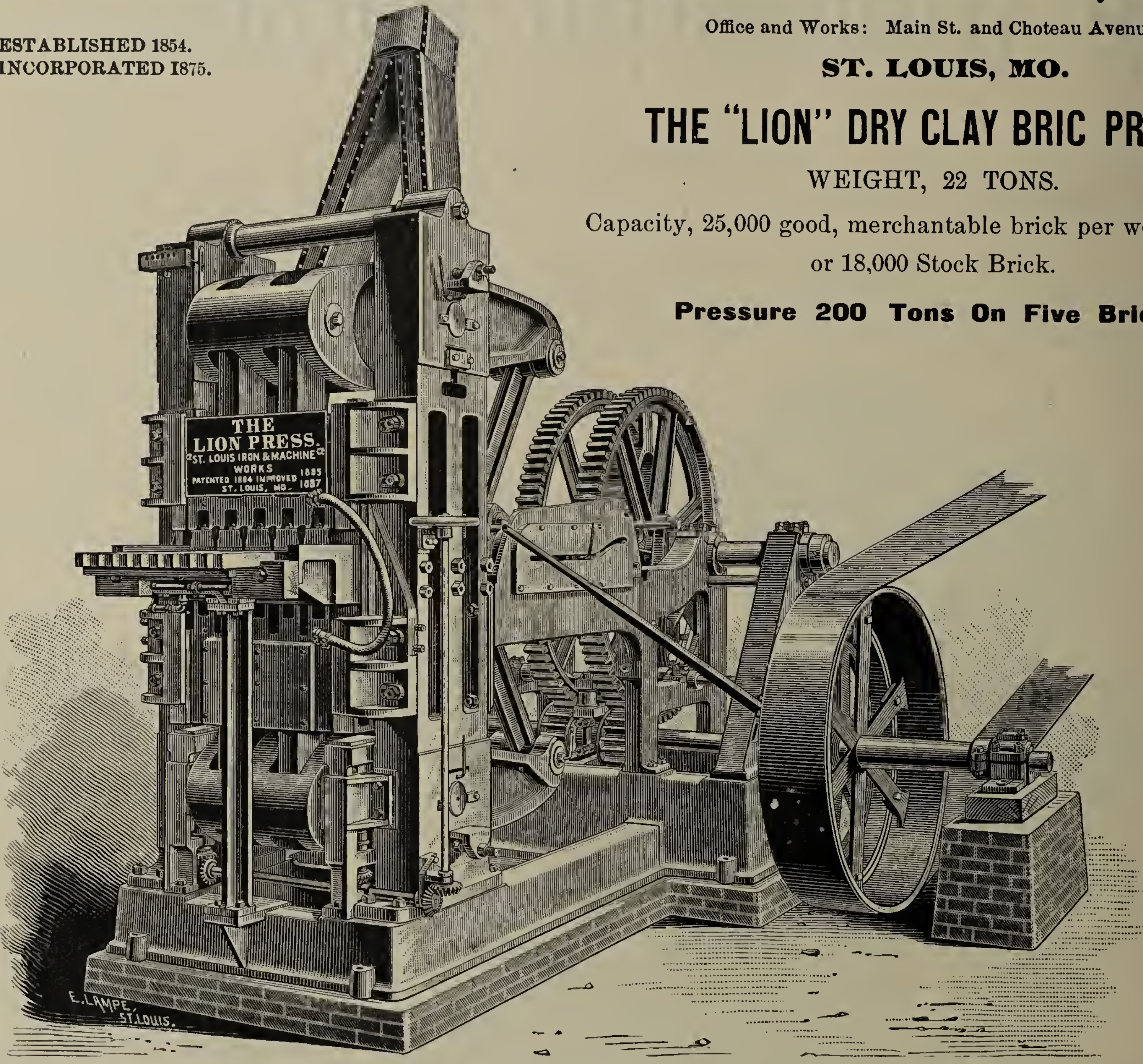
Office and Works: Main St. and Choteau Avenue,
ST. LOUIS, MO.

THE "LION" DRY CLAY BRIC PRESS.

WEIGHT, 22 TONS.

Capacity, 25,000 good, merchantable brick per working day,
or 18,000 Stock Brick.

Pressure 200 Tons On Five Bricks.



We claim the following essential features and advantages for our Machine:

1. The main feature of this machine is its great strength, power and durability. The pressure on each brick being 40 tons, and the working parts are so strongly constructed that there is no spring or give under this working strain. 2. The great simplicity and openness of framing and construction, so that every part of the machine is easily accessible for inspection, lubrication and adjustment, thereby reducing the necessary repairs, incidental to every Brick Press, to a minimum. 3. Pressing 5 bricks at each revolution of Machine, keeps the regular force of off-bearers and setters fully employed, which a 4 Brick Machine cannot do. 4. The adjustment of machine from common to stock brick and vice-versa, can be made in a few minutes' time.

Besides the Press, we manufacture and furnish a complete set of clay preparing Machinery, Elevators, Mixers, and Rollers; also Engines and Boilers complete. We also build different kinds of Steamboat Machinery and Steam Boilers, Corliss Engines, Cotton Compresses, Water Work Plants, Coal and Mineral Mining Machinery, Bridges Work, Hoisting Travelers, Cranes and Elevators; also general and large castings and Machinery. Any further information cheerfully given.

TESTIMONIALS.

St. Louis Iron and Machine Works, St. Louis, Mo.

KANSAS CITY, MO., September 28, 1888.

GENTS: The two "Lion" Presses I bought from you about two years ago have given me entire satisfaction. As a dry clay press I think they have no superior. I prefer the "Lion" to the "Hydraulic". Ever wishing you success with the "Lion," I am,

Very Truly Yours, DRUBY UNDERWOOD.

OFFICE OF
TENNESSEE BRICK MANUFACTURING CO.,
NO. 7 MADISON STREET,

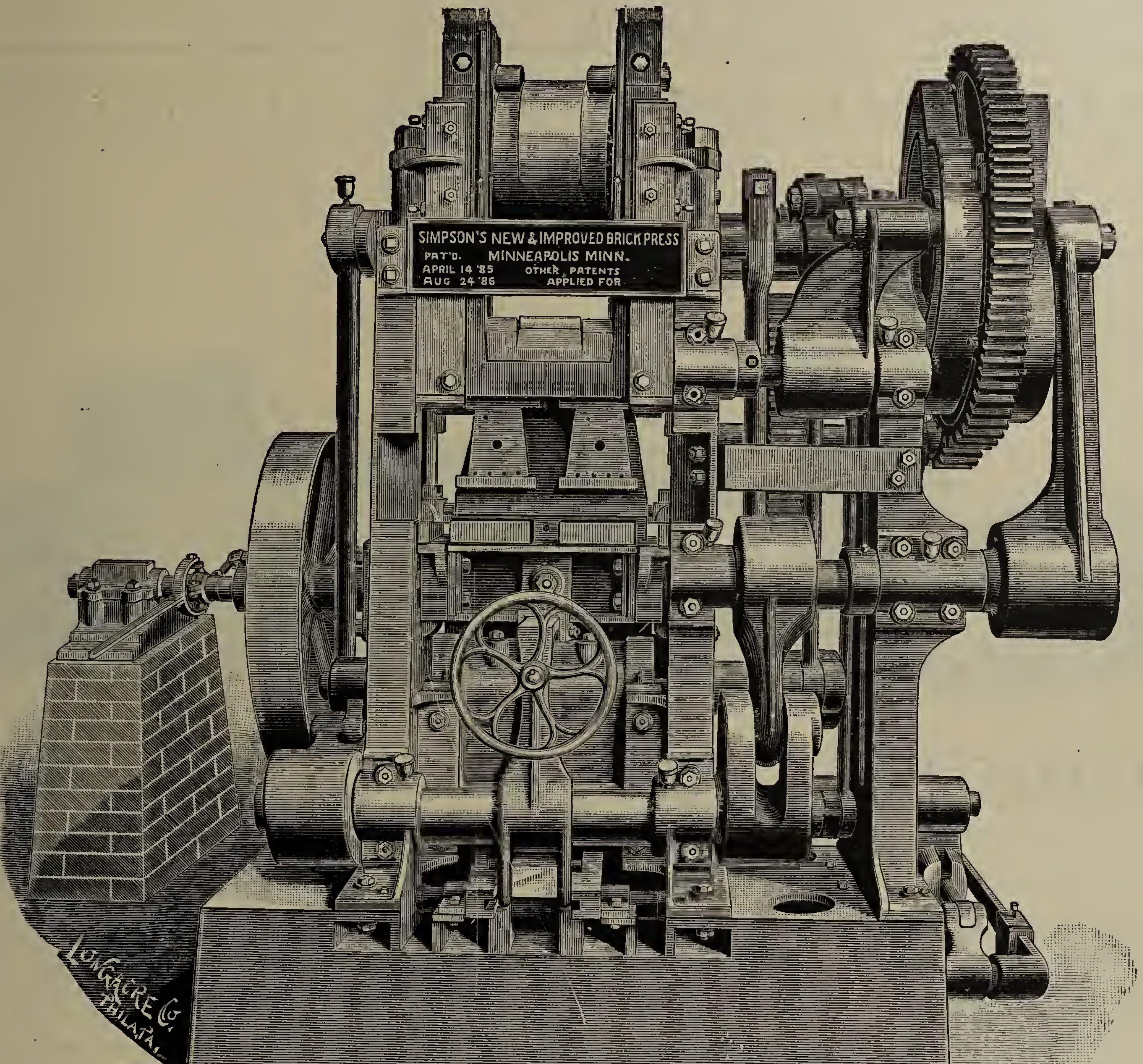
MEMPHIS, TENN., September 28, 1888.

St. Louis Iron and Machine Works, St. Louis, Mo.

GENTLEMEN: In reply to yours of 25th inst., we beg to say that our Company contracted with you last spring for one of your "Lion" Brick Machines, having concluded, after our President and Superintendent had thoroughly investigated most of other machines, including the Hydraulic, that yours possessed more advantages and promised better results. In due course the machine was delivered, set up and put into operation. After having operated it all summer to full capacity, we are more than pleased with results and can heartily recommend the Machine to any one contemplating a purchase. To fully appreciate the merits it must be seen performing work.

Wishing you that eminent success which you so well merit we remain Yours Truly, C W. EDMONDS, Sec. and Treas.

SIMPSON'S NEW
AND
IMPROVED BRICK PRESS.



Send for particulars and prices

SIMPSON BRICK PRESS CO.,

Room 91, No. 59 La Salle St., CHICAGO. ILL.

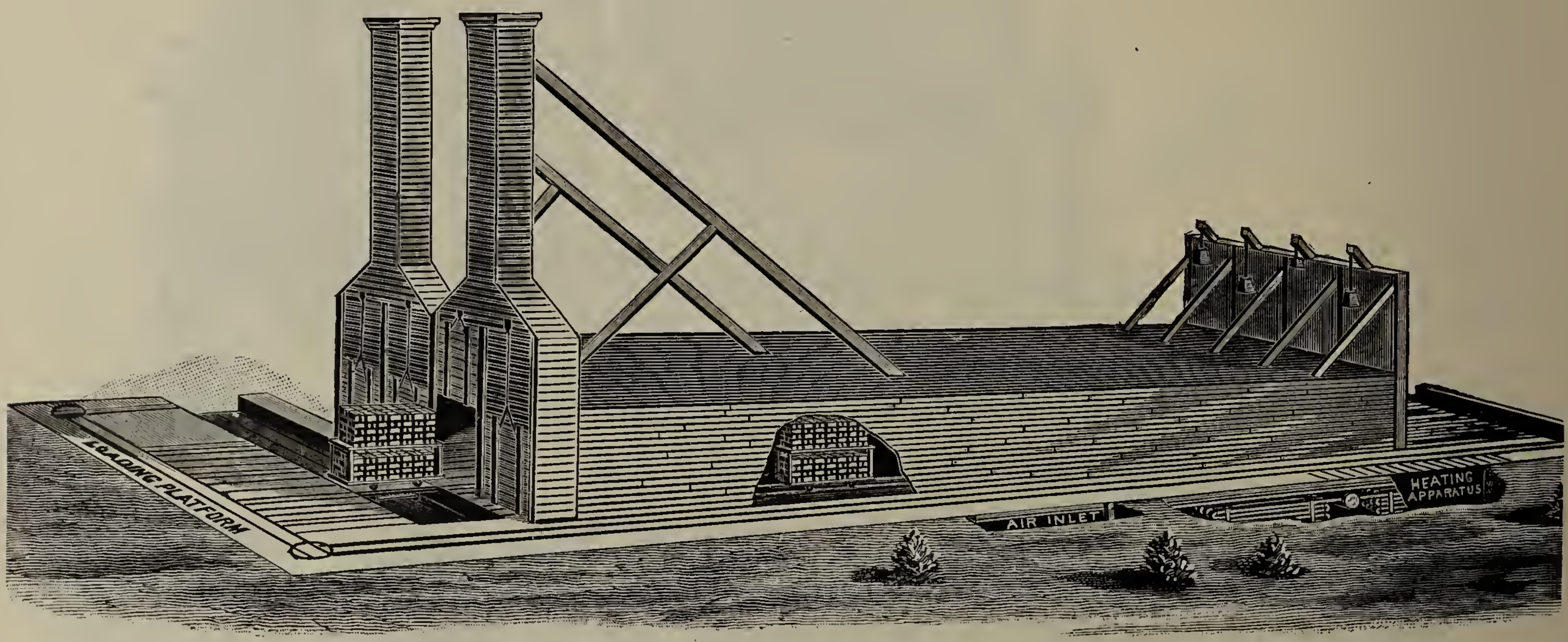
BRICK DRYERS.

We are prepared to erect Dryers to dry any clay.

YOU SAVE EXPENSE OF SHEDS. . . . .
. . . . YOU WORK DURING ENTIRE YEAR. . . .
YOU SAVE TIME AND FUEL IN WATER SMOKING

NO FROZEN BRICK. . . . .
. . NO INTERUPTIONS BY RAINY WEATHER .
NO DELAYS BY WAITING FOR DRY BRICK . .

WOOD BUILDINGS H EAP TO CONSTRUCT



CHICAGO IRON-CLAD DRYER,

FOR ALL KINDS OF BRICK AND TILE.

This Dry House is a combination of the Drying Floor and Tunnel System. The radiation from the Iron Floor extending over the heating coils dries the lower tiers of bricks. The perforation of the Iron Floor gives an even distribution of the heat and prevents cracking. The steam heat is not so intense as to melt down the bricks or bake them. The bricks are dried smoothly and burn evenly, with a good ring. The water smoke is drawn off as rapidly as made, and the drying is even and gradual. Stiff mud bricks are hacked on double-decked cars. Soft mud bricks are dumped on pallets and cars carry the same through Dryer. Semi-dry and dry pressed bricks are specially provided for and can be dried without injury. Our buildings are constructed entirely of wood; are simple, cheap and easily erected. We furnish complete steam heating apparatus with pipes connections, Iron Cars, Turn Tables, Transfer Cars and Rails. Confer with us before contracting elsewhere. We will save you money, time and trouble. State character of bricks made, name of machine used and capacity required.

I. & M. WOLFF & COLEMAN,

PATENTEES AND SOLE BUILDERS,

Write for catalogue.

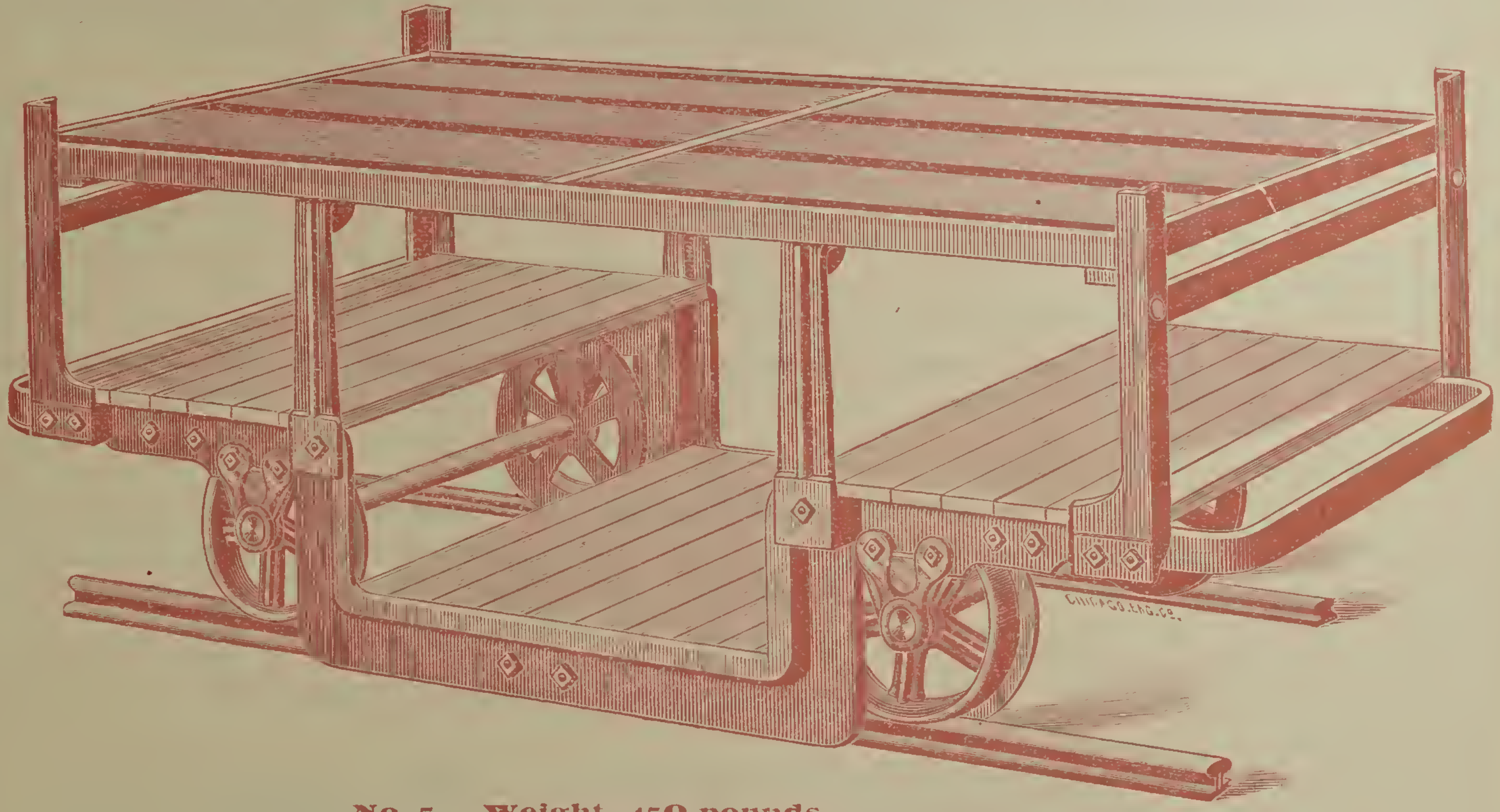
No. 261 Dearborn St., Chicago, Ills.

THE CHICAGO IRON CLAD DRYER

BRICK TRUCKS.

Cut No. 5 shows our double-decked car which we use for drying all kinds of brick made sufficiently stiff to be run at once into the dryer.

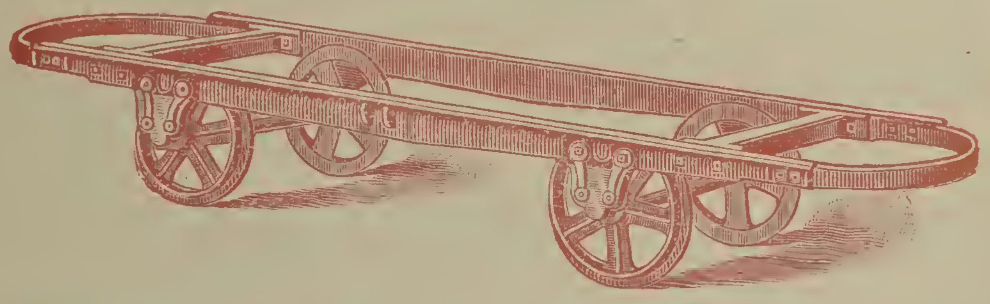
On the depressed portions of the lower deck we hake the green brick 2 tiers high and on the upper parts of the lower deck we hake them 3 high; on the upper deck we hake four bricks high. The objects in forming the depression in the bottom of the car are to obtain a greater capacity for the car, and also to prevent the heat from rising too rapidly from the bottom to the top of the hakes of bricks on the car.


CHICAGO ENG. CO.

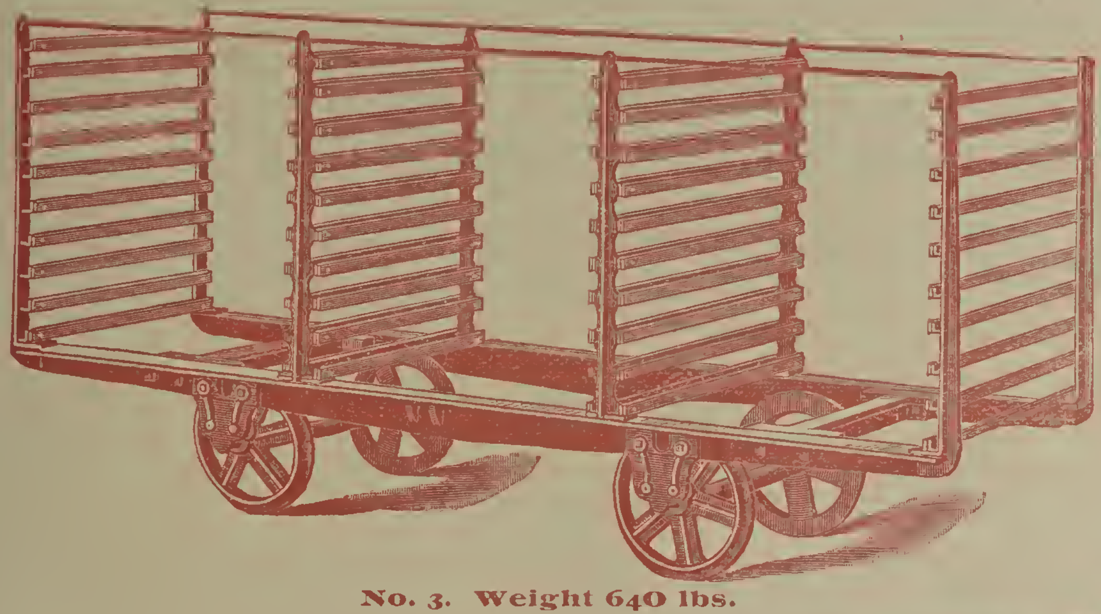
No. 5 Weight, 450 pounds.

Car No. 5 can be used for handling and drying bricks made by all the stiff-mud machines. Bricks made by the dry and semi-dry process can also be advantageously dried upon this car where the nature of the clay employed, or other circumstances require the employment of our Iron-Clad Steam Dryer.

Cut No. 2 is simple frame car which is used for foot pallets.



No. 2. Weight, 330 lbs.



No. 3. Weight 640 lbs.

Cut No. 3 is for bricks that are too soft to hake and when pallets are necessary. These racks, together with the car, are constructed entirely of iron. They will be found strong and durable, and afford the best method of using pallets. They do away with the use of the foot pieces on the pallets, which are so much annoyance in handling. We make these racks for the pallets to slide in lengthways of the cars so as to bring the side of the bricks towards the heat and also to afford conveniences of putting in and taking out the pallets.

Cut No. 4 is a substantial as well as a light frame—made entirely of wrought angle iron and strongly braced, which is to be used for a top deck for the car, as shown in cut No. 5.

Slats of woods are used for both the bottom and top decks, and these are used for bricks that can be haked, and for semi-dry and dry pressed bricks placep on top of the other.

No. 4.

I. & M. Wolff & Coleman,

[Mention the Clay-Worker.]

261 Dearborn Street, CHIAGO, ILLS.

DRYING

RE-PRESSED

BRICK.

CARTERET BRICK WORKS.

CARTERET, N. J., July 13, 1889.

I. & M. Wolff & Coleman:

GENTLEMEN—Your letter of 2nd, asking how we are are pleased with the "Dryer" duly received.

We started the Dryer last November, and have been using it ever since. We are well pleased with the work it is doing. We do not think there is one-half of one per cent. checked in drying, and of bricks passed through the Dryer, at least 80 per cent. are pressed brick. We will soon give you an order for two stacks more.

Yours Truly, F. ROWLAND, Supt.

IRON-CLAD STEAM DRYER.

I. & M. WOLFF & COLEMAN,

261 Dearborn Street and 14 Third Ave., CHICAGO, ILLS.

THE CLAY-WORKER

VOL. XII. INDIANAPOLIS, IND., DECEMBER, 1889. No. 6

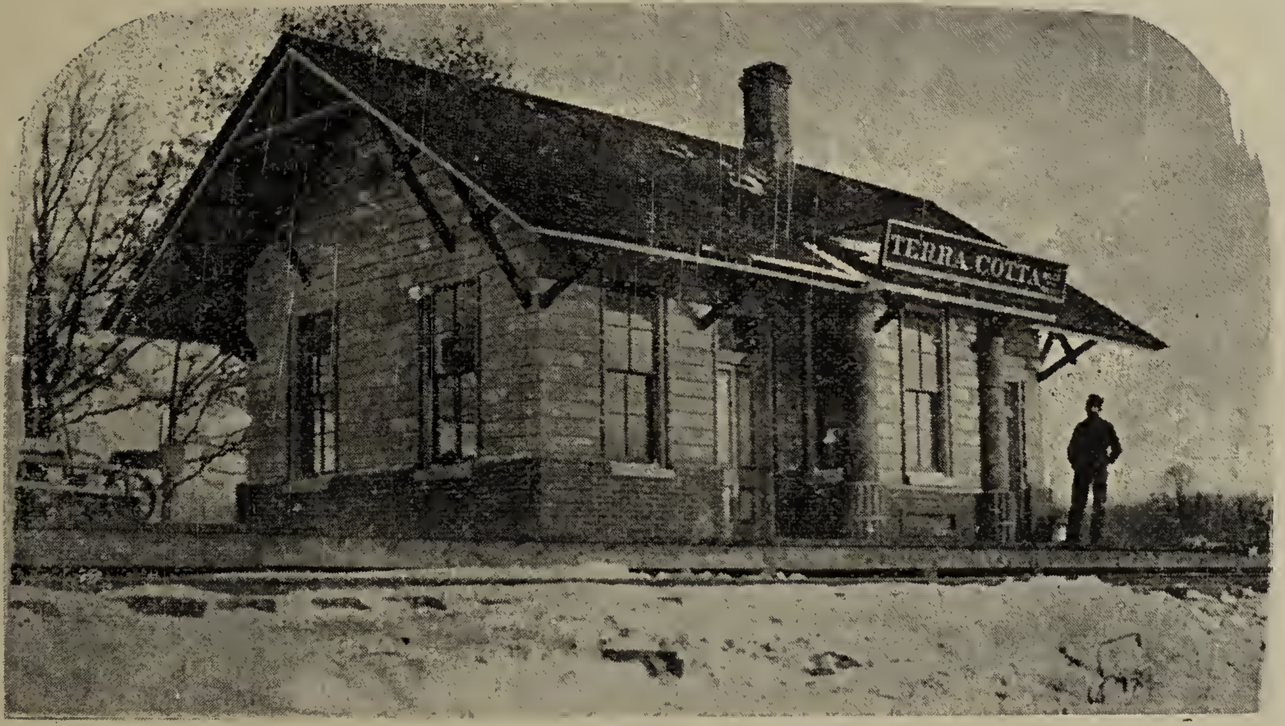
Written for the Clay Worker.

EXAMPLES OF AMERICAN BRICK AND TERRA COTTA WORK.

No. 22.

RAILWAY STATION, TERRA COTTA, ILL.

Among the oddest, and yet one of the most attractive structures we have seen in our travels of late years, is the subject of this sketch. The idea of adapting drain tile to architectural purposes is a novel one, and has probably occurred to few, if any, of our readers, who are familiar with that homely, though useful clay product. The accompanying sketch will show, however, that such use may be made of tile, and that, too, with pleasing effect. The plan originated in the prolific brain of our good friend, Wm. D. Gates, President of the American Terra Cotta and Ceramic Co., whose works are but a short distance from the station, which is located on the Chicago & Northwestern Railway, some thirty miles from Chicago.



RAILWAY STATION, TERRA COTTA, ILL.

The building is 18x32 feet, with a projection in front of four feet. It is divided into three rooms, a baggage room 9x16, a passenger room 13x16, and an office 8x20 feet. It was built soon after the establishment of the factory, and the material was such as could be turned out quickly. The building blocks were made on a tile machine, using a seven-inch square die, making 7x7x10 inches, with a center partition, so there are in the wall two dead air spaces of two and a half inches each, and three upright partitions. The plaster was put directly on the inside surface. Fearing that the plaster would not adhere to the blocks they corrugated them on one side. This, they afterwards found was not necessary, as, with their clay, the plaster takes firm hold and sticks fast.

The base about the building was built of brick, which it was thought would better stand the rough usage, that might, it was feared, break the blocks.

For architectural effect, the front is ornamented with two columns of drain tile, into which the walls run and are anchored. The bases of the columns are larger, projecting, to correspond with the brick wall or base. The columns are made of three-inch drain tile, making a column composed of a number of small columns.

The building blocks are a light cream color slightly fire-stained with red, making a very pleasantly variegated surface,—the base and trimmings being red.

MASONS' measure is reckoned at 7½ brick per foot super for each half brick of thickness of wall. To get the lengths of walls, measure the outside exclusive of pilasters. At re-entrant angles measure the thickness of wall one way, thus giving the actual material. The section of a pilaster is measured as the sum of its face and returns multiplied by its projection from the wall. Measure openings four feet wide or less as though the walls were unbroken.—*Ex.*

KNOW THE WORTH OF THINGS.

There is quite a difference in the quality of goods that one may have. A tile manufacturer has a good clay, good machinery and kilns. He makes an excellent article. The tile are straight, round or perfect in form, smooth at the ends, and uniformly well burned, and handled with care throughout from the press to the storing yard. They are worth more than rough, warped and unevenly burned tile. When a tile manufacturer has a good article of tile he ought to ask the worth of it. The manufacturer that has a poor article of tile is very likely to cut the price. The purchaser of tile should never hesitate to purchase the better article at its worth. The work of underdrainage, if well done, is a permanent improvement, once done, to last for generations. No one can afford to use imperfect material in underdraining any more than he can afford to build a costly house on a poor foundation. When the prices of tile are being cut very low, don't be in a hurry to sell. Money is often made by waiting for the "rain wagon," and other things. When parties have a good article they can afford to wait. It is well, however, to impress the trade with the importance of using only the best at a reasonable price.

Written for the Clay-Worker.

BRICKMAKING AND BURNING.

No. 9.

BY J. W. CRARY, SR.

[Copyrighted.]

It is an old saying that "doctors will differ," but intelligent doctors all agree about some things they have found to be true from long practice and well settled principles. How intelligent, practical brickmakers can disagree about the necessary kind of clay, for a certain specified kind of brick, how they can disagree on the best, proper manipulation of clay for making a certain kind of brick, how they can disagree about the principles involved in the best way to set and burn brick thoroughly, I am at a loss to see. The many vague and speculative ideas I notice by writers on brickmaking and burning, shows the great need of some well styled principles and formula for the common guidance of brickmakers. There are various kinds of clay when chemically considered, but only two forces can be used to make any of the varieties into a brick, viz.: Cohesive attraction by pressure, and crystalization in the drying process by tempered, plastic clay. Now all intelligent brickmakers must know these facts. Now it follows as a corollary that if brick are to be made of plastic clay, then the more it is disintegrated and tempered, the better and more perfect the crystalization. It also follows as a demonstrated fact that if brick are to be made of "dry clay," then the more it is pulverized and comminuted or stirred together, the more perfect the cohesive attraction under the necessary process. It also follows that the pressure must be perfect, so that all the particles are completely joined, otherwise the principles upon which the good quality of the brick depends, is only partially carried out.

DRYING, SETTING AND BURNING INVOLVE CERTAIN PRINCIPLES.

All brickmakers will admit that brick must be dry enough to stand the pressure of about fifty brick, or about three hundred pounds to the brick on edge, before they go into a kiln. They will also admit that brick must be set in such a way and manner, as will allow the heat from the arches, or furnaces, to freely pass up through the body of the kiln, and that any interruption of these features and conditions, is a violation or departure from the true principles involved. All good brickmakers further know, that only a certain amount and degree of heat can be safely applied to a "green" kiln of brick, and that when a kiln is dried off and the "fires up," the fires must be increased to a degree hot enough to indurate the clay, through and through, and kept at that heat, until it appears all over the top of the kiln, whəether it settles or not. Now, I notice that some writers talk about the practicability of making any kind of brick of clay. I notice that some writers treat setting and burning brick as though all kinds of clay should be managed exactly alike, and put in a lot of crotchets just by way of saying odd things, such, for instance, as that "there must be three bricks in a 'bench,' five high in the overhangers, and two of these courses tight, then the platting must be put on two courses flast, and firt course of green brick, an inch apart, and next, or top, of whole, good burned brick, tight together, except at intervals of five brick, while watersmoking, then if there be a cold spot, the platting to be closed tight (where it was left open) until the cold spot gets hot, etc., etc." Now why should there only be three brick "benches?" Why should any of the overhangers be set tight? Why should whole green brick be put on top of the kiln, for first course platting? Why should whole, good burned brick, be put on for top course platting? And why should they be put on tight? And why should every fifth course be left out? And, in the name of common sense, I would like to know, why these apertures are to be closed in order to work out a "cold spot?" All these things are old worn-out whims, and have neither reason, force or utility. I tried them all forty years ago, and was glad to go to their funeral, so far as I was concerned.

THE QUESTION OF "SETTLING BRICK KILNS"

Has lately taken a start. I have already discussed this matter in my former articles, before which time, not a single writer on brick burning, seemed to know that some clays would not shrink in burning, but they begin to pop up now, and say, "I told you so," I noticed a writer in the Clay-Worker, seemingly the oldest in it, alludes to clay at Mississippi City, and Slidell, La., that will not shrink in burning. I had long ago said in one of my articles, that all the Gulf coast clays would not fuse or shrink in burning, but some of it would swell. I also stated, that at some localities in Arkansas, Missississippi and Alabama, in the interior of these states, clay is found of the same character, and that I knew this fact by actual, personal and thorough experience. I have not yet written a single word about what I know of brick, from hearsay, nor have I borrowed a single idea from any other writer. Without referring to my articles, I think one of them, concisely treats of the causes of shrinkage in clay that will "settle" in burning. The idea that clay will "settle" when the air is expelled, is vague and without reason. When silicate of alumina, or pure sand and clay is used to make brick, it will stand a glowing white heat without fusing and if the sand is in excess, a brick will swell. Now, if an alkali or flux be mixed with this clay, it will shrink and fuse just in proportion to the amount of alkali mixed with it. As I have before stated, I have mixed fusible clay with infusible, about half and half, and found the brick would fuse and shrink in burning. I have put two ounces of soda in a brick of infusible clay, and found the brick shrunken after burned. If infusible clay be made plastic, with strong lye water, it will shrink and fuse in a very hot kiln. My clay is infusible, don't shrink or swell, and burns to a cream color. I have put brick in first course below top of my kiln, made of the common red and yellow clay used to make red brick, and when I opened the kiln, the red clay brick was found liquified and run down the kiln. It takes a glowing white heat three days and nights to burn my clay. It may be proper here to repeat the should-be, well-known fact, that most all the diluvial and alluvial clays—such as are found on the plateaus and banks of our rivers, are fusible, and will make good red brick, with proper use and burning. It is the anti-diluvial primitive clay with sand, forming pure silicate of alumina, that is infusible, and will not settle.

THEORY OF SETTLING A KILN OF BRICK.

In all fusible clays, there is a certain quantity of flux, or alkali and iron, when the heat of the kiln is sufficient to oxidize and fuse the flux in the clay, the particles of clay are soldered together, and thus the pores or spaces left in the brick, in the drying or crystallizing process, are contracted, and to a good extent closed, so that the brick is shrunken, and hence the kiln is "settled," as we say, of course, there will be no "settle" if there be no solder.

TO GET A GOOD, BRIGHT RED BRICK.

In the first place, there must be a certain amount of iron rust, or oxidized iron, in the clay to give a red color, when heated to a certain degree. Second—

Care must be taken, to see that the heat is not sufficient to fuse the alkaline salts in the clay, as this will give the brick a dark, and iron metallic color. Third—No coal dust should be mixed with the clay, nor coal placed in the body of the kiln, as this will produce irregular heat, and oxidize the iron and salts, and leave a sulphuret of an ashy color, on the surface of the brick. To make good red brick, the clay must have the right quantity and kind of iron in it, then it must be thoroughly mixed and well tempered, then the brick must be set regular. There should be no large open spaces, nor should there be any obstruction to a free, regular circulation of heat, except the binding course just on the closing course of the overhangers. This should be tight so that the fire will spread when it strikes it. The benches of the kiln may be four brick or about thirty-four inches wide and should be set skintling or zigzag, open and regular, the overhangers should be set the same. In the kiln, the brick should be set three over three, and if a uniform or face brick is desired, two courses should be set, running same way, thus, reversing every two courses, instead of every other course; this prevents fire marks on one edge of the brick, and gives a better draft up through the kiln. One course of platting should be put on top, at least one inch apart, and it may be of whole brick, or of burned bats. The watersmoking should be slow, the outside arches, especially at the corners, should be kept a little the hottest. This insures good corners and outsides.

No "settle" should be made until the fires are all out on top, and then the heat should be gradually increased, until the overhangers are as hot as they will stand without fusing. This heat should be kept up with careful attention, and as soon as a spot begins to settle, damp, fine clay, should be put on that spot, so as to prevent further draft of heat to that point, and this process of covering with clay should go on, as fast as spots begin to settle, until the whole kiln be covered. As the covering thus proceeds, less fuel and labor is needed, and by the time the kiln is all covered, the use of fuel is reduced seventy per cent. When a kiln is ready to close, no fresh fuel should be added, but the doors should be closed tight, while the arches are hot. A kiln should not be opened until it is cold enough on top, to allow a person to pull up platting without burning the hands. Bats and clay should then be carefully shoveled off, and the arches opened. No one of good judgment and experience, can fail to make good uniform red brick from two or three courses above the arches to top course of kiln, if these suggestions are properly followed. The same rule will apply to the setting and burning of clays, that do not settle, or burn red, only, that a far more intense heat is required, and, covering with clay as I have directed in other articles, being an indispensable necessity, if good brick are wanted. Setting and burning brick, so as to arrive at a uniform good standard for a brick, is of such importance, I will have more to say hereafter on the subject.

I will add here, that if there be any objection to covering a kiln with clay, as it begins to settle or "burn off," in spots, for fear that clay dust will get down in the kiln when being thrown off, the clay can be wet and tempered a little, so as to be a stiff mud, then put on the kiln, treading it, so as to close the platting. This clay should be quite sandy, so that it will not shrink much. This, when thrown off of kiln, will be burned in cakes and pieces, leaving no dust to fall down in the kiln. But I never find any trouble by dust, when I use damp, pulverized clay, about the same as the brick are made of. This plan of covering a kiln with clay, as I have directed, instead of trying to work the fires by closing the platting, or by changing fires in furnaces, or arches, will be found to be of great advantage and benefit to brick burners. It saves at least ten per cent. in fuel and labor, it gives complete control of fires, and insures a strong, thoroughly burned, bright colored brick.

Written for the Clay Worker.

A TALK ABOUT BRICK.

BY PROF. R. T. BROWN.

When in his transition from the savage to the civilized state man had passed the condition of a nomadic herdsman, and, abandoning his tent, he proposed to make for himself a permanent home, he would naturally look about him for the building material. With his rude tools of flint, he could work stone into the proper shape more readily than wood, but on the broad plains where he had pastured his flocks, stone could not always be obtained. He had no doubt observed that clay, on drying, became hard, and the suggestion would naturally arise, that if he put it into the proper shape while soft, and suffered the sun-heat to bake it, he had a building material that required no tools to prepare it, and so long as he protected it from rain it would remain permanent. This was, very naturally, the first and oldest form of brick, and perhaps, was not the invention of any race or age, as we find the use of adobes connected with the early stages of every nation that has made any considerable advance toward civilization. The vestiges of a prehistoric age in almost every country show evidences of the use of unburned brick in the construction of the earliest human habitations. Not only in western Asia, in Egypt and in Ethiopia, do we find the remains of these primitive dwellings, but on this western continent, in Mexico and Central America, unburned brick was originally, and continues to be, the principal building material used for ordinary dwellings. In the rainless regions of Peru the nations, according to Prescot, had carried the art of making adobes to a wonderful degree of perfection. It is not at all improbable that the prehistoric race who built the earth-works and mounds of the Mississippi valley understood the art of making brick, though like other Aboriginal Americans they had not mastered the mystery of burning them.

This idea was suggested to me many years ago while examining a mound in the White Water valley in Eastern Indiana. The mound was on terrace, or second bottom land, composed of a sandy loam, resting on coarse gravel, two or three feet below. The mound was about twenty feet high and composed of strong clay, evidently brought from a hill, half a mile distant, for there was no clay nearer. Now why did the builders prefer to bring clay half a mile rather than to use the earth in the immediate vicinity, if they did not mould the clay? But if it had been moulded, the rains and frosts of centuries had reduced the clay to its original form.

Who discovered the secret of burning brick, or how it was discovered, will, perhaps, forever remain buried beneath the accumulated centuries. There is an Arabian legend which says some man built a house of sun-dried brick, and kindled his fire to cook his food against one of the walls. After practicing this for some time he discovered that the bricks thus exposed to the heat had undergone a remarkable change in color, hardness and permanence. But aside from the legend, it is evident that the discovery was accidental, for no man, from studying the sensible properties of clay could have come to a correct conclusion as to the effect of a high heat on properly prepared clay.

From the Bible account of the tower builders in Shinar, as well as from the oldest Assyrian tablets. it is evident that the method of rendering clay indestructible by a high heat was well understood 4,000 years ago, but we have no hint as to how the heat was applied, or what kind of furnaces were used. It appears, however, that in the early ages, burned brick was used only for special purposes. The great wall of Babylon, the most stupendous brickwork that the world has ever seen, had only a veneering of burned brick, two or three feet thick on the outside, the interior being filled in with unburned brick, the whole being protected by a waterproof covering of concrete.

The idea of an adobe wall was brought to its highest perfection in the rebuilding of Rome after the great fire of Nero. The walls were built of sun-dried brick laid in Roman cement, and hard burned brick about twelve inches long. six inches wide and one and one-half inches thick, were attached to the outside by being pressed firmly against a coat of evenly spread stucco while it was yet soft. In some of the ruins of ancient Rome, these tile-like bricks are found adhering so firmly that the brick will break before the attachment will give way.

Much of the superior excellence of ancient brick was owing to their being perfectly dried before they were burned. Pliney tells us that the Greeks would not allow brick to be used till they had been dried five years, but this probably refers to adobes.

After the invasion of the northern barbarians, the art of brickmaking declined with the decline of the Roman empire, till in the middle ages it was almost entirely lost in Europe; but in eastern Asia the art appears to have retained its excellency unimpaired. China, Japan and India have made good brick from the highest antiquity to the present day. Even in the hill country of Napal, north of Bengal, travelers report that the buildings are made of brick of the highest excellence and beauty.

Brickmaking revived in Europe about the middle of the sixteenth century, Holland taking the lead. Nearly all the permanent buildings in the modern cities of Europe, and in this country as well, are built of brick.

It is a fact worthy of a passing notice, that from the day of the Assyrian brickmaker, down through the ages, nearly to the middle of the present century, the ancient method of making brick can be obtained in every country.

In the early years of this century all the brick in use was made of clay tempered by treading with horses or oxen. About 1830 the pug mill appeared in the western brick yards; how long it had been used previously in the East, I am not informed, but it was the first innovation on the ancient method of preparing clay for moulding. From this, the next advance was to fill the moulds as the clay was delivered from the pug mill, automatically. In 1839 a patent was granted to Jesse Reeder, of Cincinnati, to mould brick from untempered clay, by pressure. More than a million of brick made on this machine were used in 1840 in constructing a tunnel for the Whitewater Canal at North Bend, Ohio. These remain in a good state of preservation to the present. In 1847, Nathan Sawyer obtained a patent for making bricks from dry clay, and about the same time Woodworth and Morven got a patent for moulding brick on the same principle, but by a different application of power. From this beginning, machines for manufacturing, and kilns for burning brick have multiplied with astonishing rapidity.

These brick machines are now so numerous that we cannot even catalogue them. They may, however, be grouped in four classes: those which make dry pressed brick, semi-dry, stiff tempered clay, and soft mud brick. Many brick presses, both for dry and semi-dry clay, have proved failures from overlooking the fact that clay in every form is an *inelastic* substance and will resist a sudden pressure, however strong, while it will yield to a continuous pressure, though much feebler. The stiff clay machines operate on the principle of moulding drain tile, the tempered clay being forced through a die in a continuous stream and cut into the proper length of brick by an automatic arrangement. Machines are now so far advanced towards perfection that, at the present price of labor, hand-made brick cannot compete with those made by the better class of machines.

Numerous improvements have been made in the matter of burning brick, both in the kind of fuel and shape of kiln. Formerly brick was burned exclusively in clamps and wood was the only fuel used. Now permanent, and often continuous kilns are used, coal, crude petroleum, or natural gas is generally substituted for wood.

It is a law in all industries, that when an article is manufactured by machinery it becomes a commercial commodity at once. It was predicted that brick, from its great weight, and consequently expensive transportation, would not follow this law. but we are already demonstrating the fallacy of this prediction. Brick can now be made by machinery, burned by natural gas and freighted by rail 300 miles and sold cheaper than hand-made brick at the point of sale. Such is the present condition of the brick manufacture—what will be its future? In a matter that has progressed with the rapidity that brickmaking has in the last forty years, it will be hazardous to venture a definite answer to that question. The restless activity of invention on this subject is evidence that, in the public apprehension, perfection has not yet been reached in brick machinery, but what additional step shall reach that point, we dare not predict. But the advancing price of lumber, and the scarcity of reliable building stone, warrants us in saying that we are nearing the time when all private, and most public buildings, will be made of brick. An inexhaustible supply of the raw material, with improved machinery, will make brick the cheapest building material, as it is the best.

Written for the Clay-Worker.

HINTS ON BRICKMAKING.

No. 42.

BY "R. BRICK."

BRICK BURNING.

This department of brick manufacture is constantly coming to the front as the key to the situation. This is the point where most enthusiastic would-be brickmakers have met their Waterloo, and this is the rock that will wreck many another unwary mariner on the muddy seas of brickmaking.

There is nothing that makes me so utterly "tired," as to hear an alleged brickmaker tell how he burned a kiln in two days and four nights with just half the amount of fuel that any other man had ever used before. It is true that there is a vast difference in clays, some requiring more fuel, as well as more time to burn them.

The time it takes to burn a kiln of bricks is an insignificant item, and the amount of fuel used is a matter of secondary importance. The great objective point is to make a good burn, that is, ninety per cent. and upwards of hard bricks, with ninety-nine to one hundred per cent. of the brick burned fit for market. Do this *every time*, and nine cases out of ten, you will succeed as a brickmaker.

The ruinous policy of sacrificing the quality of the brick, as well as destroying a large percentage of them to save a few tons or cords of fuel, and a few hours or even days of time, is followed by some manufacturers, and they will persist in it until they fail miserably.

I have known instances where manufacturers of brick compelled their burners to burn their kilns within a given time, and to do this, melted the arch bricks and left thousands soft in the top courses, to humor an absurd whim. Some of the best processes of burning are condemned by many manufacturers, because they require forty-eight hours more time than the process they are using, even though in the end, there is a considerable saving in labor and fuel.

I believe in using a kiln that *insures* the manufacturer a well-burned kiln of bricks *every time*, even though it requires more time and more fuel. A New York merchant can send a cargo of goods to a foreign port cheaper than can his competitors, by sending them at his own risk, thereby saving insurance premiums that others pay. Would he display business sagacity and foresight by this scheme? Is it not best to pay more money and secure his profits? There is just as much sense in trying to save paying insurance premiums on goods shipped by an ocean steamer, as there is in using a kiln that saves a little time and fuel, and risk having a poor burn.

Use a kiln that carries assurance with it, one that will bring forth good fruit every burn, to the satisfaction and profit of the owner.

It is not the intention of the writer to condemn a kiln that burns with little fuel and short time, provided it does its work well, turning out good brick with little or no waste; I only wish to show the folly of trying to gain time and save fuel at the sacrifice of good results.

I must add, however, that when we have secured a good kiln, it is then necessary to secure the services of a successful burner. We have not yet reached that golden era in our business where we can burn a kiln by "printed rules"—only requiring a man of muscle, with sufficient education to read the rules, to make a perfect burn every time. When this is done, then any one can take his chemicals, brushes and canvas, and his "printed rules," and paint pictures that will rival those of the immortal Raphael, or Michael Angelo—or with mallet and chisel carve from a block of marble the "Three Graces."

I know it is risky to write so familiarly about this great subject, on the eve of the annual meeting of the brickmaking solons at Philadelphia, but I plead the privilege that age gives, and know that the brethren will have respect unto my gray hairs—those that have gone before, as well as those that still remain with me—even though they differ radically from me in politics.

Let us all meet in the City of Brotherly Love, and exchange views on this and other subjects pertaining to our great craft, as well as to determine the location of the World's Fair in '92, and any other small matters that may be suggested by my distinguished and esteemed friend Purington, of Chicago, formerly of New England.

Written for the Clay-Worker.

SEWER PIPES AND THEIR MANUFACTURE.

BY ALFRED CROSSLEY.

[CONTINUED.]

I will now attempt a description more or less complete, of the actual process and method of the manufacture of sewer pipes. In the early part of this paper, I gave a brief summary of the earlier attempts at sewer pipe making and of the processes in vogue. I will now speak only of the methods in use within the memory of many now living and show the marvellous strides which this industry has taken in that short space of time. Not over 40 or 50 years ago, if my information is correct, sewer pipes were made by hand in wooden and plaster moulds and we may readily suppose it did not take much capital to go into the business. About 40 years ago, I think, sewer pipes began to be made on a horizontal tile machine of the plunger pattern and worked by hand, horse or steampower, pretty much as drain tiles are now made, though in a much more primitive style. After that came the vertical machine worked by the rack and pinion motion, and the power furnished very often by hand. This, however, was a great improvement; larger sizes of pipes could be made and were in better shape to handle, but still the clay had to be quite soft to avoid breaking. I have a cut of one of these machines now, with a man turning the handle which would afford some amusement to a sewer pipe man nowadays. Nevertheless, this machine would make up to 18-in. diameter, unsocketed. It was made by Claytons', of London. The next step in advance, was the screw machine which was much in advance of any hitherto brought out. This remained for years the standard, and was used in all the foremost works in England, as also one on a similar principle and very much like it, in America.

It is about thirty years, I think, since Mark Richardson, of Leeds, England, began to make his improved screw machine. He and his successor built a great many of these machines and some of them were in use in England up to a very few years ago. As this was the last method in general use until the present style of direct acting, steam socketing machine was introduced a description of the whole process may not be uninteresting, if only for comparison with our present improved methods. The machine consisted of a vertical clay cylinder about 15 in. in diameter and bell shaped at the die plate which would receive dies from 3-in. up to 18-in. diameter. Into this clay cylinder was fitted a piston or follower, to which was attached a very strong steel screw about 3-in. diameter. A vertical motion was given to the screw by a powerful bevel spur wheel, in the hub of which was a brass or phosphor-bronze nut, which worked round the screw, and driven by a bevel pinion wheel and counter-shaft on which were fast and loose pulleys driven by a belt from the engine shaft. A very powerful cross-head was needed to receive the pressure from the screw as it slowly pressed the clay down through the dies.

The preparation of the clay for this machine was done on much the same principle as now, of which I will speak further in its proper place. The gang or set of men and boys directly engaged in the making of pipes by this machine, was about as follows: One feeder, one squeezer, two or three carriers off, one fettler, one whirler, one brayer in, one sponger off, and one turner up. This reads like so much Greek to one unacquainted with the lingo of the pipe yard. Nevertheless, a little explanation makes them all intelligible, as the men were named from their avocations. The feeder, of course, fed the machine with clay. The squeezer was the man who actually worked the machine and was so named from the action of the machine in squeezing the clay through the dies. The carriers off are, of course, easily understood. The fettler was the man who trimmed the pipes to the right length and dressed or finished up the pipes prior to socketing, and this dressing was called fettling, hence the name. This man's work was often very important as the pipes sometimes needed considerable dressing or fettling to make them perfect. The dies at that time were often made too thin and with too much bevel on them, hence the pipe as it came through had a torn or ragged skin. Tending to this, also, the clay had to be made not over half the stiffness as it is now used, or there was great danger of straining the screw or breaking the cross head. Nowadays, the principle of making a die so as to put a good finish on the pipe is much better understood. The whirler was the man who socketed the pipes and derived his name from the act of whirling the pipe round on a hand wheel in putting on the socket. The brayer in, was the boy who made the sockets ready for the whirler to put on the pipe. Bray is an old Anglo-Saxon word meaning to pound or beat, and is the same word used in Prov. xxvii, 22. "Though thou shouldst bray a fool in a mortar among wheat, with a pestle, yet will not this foolishness depart from him."

This boy had a shallow, wooden mould before him, the width being the breadth of the socket, and the length the circumference of the pipe; fitting in the bottom of this mould was a leather strap a little longer than the mould, to give a hand hold. Having adjusted the strap, the boy filled the mould with clay and then pounded or brayed it till solid, then with a wire he cut off the surplus clay, and the socket was ready for the pipe. The sponger off was a smaller boy who with a sponge and a piece of soft leather finished off the inside of the socket after the pipe was put down by the whirler. The turner up was a man who, when the upper or socket end of the pipe was dry, turned the pipes over and trimmed off the ends, when, after finishing drying, they were ready to be set in the kiln.

At that time, the pipes were always handled with drums and each size below 12-in. had three different drums to suit the various stages. The first was the squeezing drum, which had an extra length allowed for waste when the fettler trimmed off the ends, for in those days there was no mechanical cut-off, which now makes a perfectly true and clean end to the pipe as it leaves the press. The next drum was a fettling drum which was a plain drum the exact length of the pipe with the shrinkage added. The third drum was the socketing drum which had a block on one end on which the socket was formed when being attached to the pipe. In making the pipes, 3-in. were made four at once, 4-in. three at once, 5-in. sometimes two at once and at others, one. All above that were made one at once, For all sizes below 12-in., the pipes were made one day and left to stiffen until the next, when the fettler took them in hand and trimmed off the ends smooth, and to the right length, dressed them on the surface and turned them over to the whirler, who then put on the sockets. I described before how the boy made the sockets in his mould, ready for the whirler. The whirler having with his drum set up a pipe on his wheel, gives it a spin round and with a piece of iron with saw teeth, scratches the surface of the pipe all round where the socket is to be put on and moistens it with a wet sponge or cloth. He then took up the socket on the belt out of the mould and wound it like a band of clay round the pipe and the drum head, which gives the inside form to the socket, handing the belt back to the boy to "bray in" another socket ready for him. Giving the wheel a twirl, he pressed and beat the socket firmly onto the pipe and then finished it with a "rib," a piece of wood cut out to the desired form for the outside of the socket. He then sat the pipe down and while the sponger off finished the inside of the socket, he went on with another.

From 12-in. upwards, the pipes were too heavy to be handled in this way and were lifted out by a swinging crane direct from the table of the machine onto the socketing wheel, where they were immediately socketed and thence taken to the drying shed on a saddle and barrow similar to those in use now. The fettling and socketing processes were thus in the larger sizes reversed, being socketed first, and in these sizes the ends were not cut off and trimmed until after the sockets were dry and the pipes turned up. I should mention here that there were one or more machines invented for socketing pipes after being made, but their use never became general in England, and the above described was substantially the method in general use. About seven years ago, in a sewer pipe factory in New Jersey, I saw the pipes made plain and then socketed on a horizontal machine, something like the one referred to in England, which appeared to answer very well. The number of pipes to a day's work in those by-gone times, was regulated by the number of each size a whirler could socket on his wheel, and hence was called so many to the wheel. This regulated the day's work of the whole gang and when the machine hands had put out "a wheel," they stopped and went home, or, if they put out more, as they would often do if the demand required it, they were paid extra in proportion. The following were the number of 2 ft. lengths of pipe of each size reckoned to a wheel (or day's work:

3-in.	700	9-in.	300
4-in.	700	10-in.	250
5-in.	600	12-in.	200
6-in.	500	15-in.	120
8-in.	350	18-in.	80

This with our improved methods looks to be but a very insignificant rate of work.

It is about 20 years, or, probably something over, since the present form of direct acting steam pipe machine or press, began to take shape. The honor of the invention is given to Mr. Spencer, and for a long time afterward it was generally known as "Spencer's Machine." His first machine was for plain pipes, which had to be socketed by hand, but soon followed, socketing dies, by which a pipe with sockets made solid at same operation was produced, and in its essential features, was identical with the pipe made to-day. The principal makers of these machines were: Mark Richardson & Co. (and their successors), and John Bingley & Co., both of Leeds, England, which has become the center and headquarters for all kinds of clay working machinery, as it largely is for fictile productions themselves also. The original socketing dies were in two halves and worked in slides underneath the die plate. Such with some improvements is, I believe, the style still in use in England. With the advent of the socketing machine, the whirler and his attendants lost their avocation, the term "wheel," as applied to a day's work, lost its significance and went out of use. The number of 2 ft. lengths made for a day's work became about as follows:

3-in.	1,600	10-in.		700
4-in.	1,400	12-in.		500
5-in.	1,200	15-in.	2ft. 6 in. long	300
6-in.	1,000	18-in.	" "	200
8-in.	900	21-in.	" "	150
9-in.	800	24-in.	" "	120

These figures, however, were often exceeded and the standard was gradually raised, as I shall show further on.

To be continued.

OFFICIAL ANNOUNCEMENT AND PROGRAMME

Of the Fourth Annual Convention of the National Brick Manufacturers' Association.

To the Members of the N. B. M. Ass'n.

GENTLEMEN:—

As announced in the official report of the proceedings of our last annual convention, the next yearly meeting will be held in Philadelphia, Pa., Tuesday, Wednesday and Thursday, December 10th, 11th and 12th, 1889.

PLACE OF MEETING.

The Convention will meet in Franklin Institute Hall on Seventh Street, between Chestnut and Market Streets. The following is the Programme.

FIRST SESSION, TUESDAY, 2:30 P.M.

Roll Call.
Reports of Officers.
Enrollment of New Members.
President's Annual Address—
Robt. A. Speed, Memphis, Tenn.
Election of Officers.
Paper, "Theory and Practice of Brickmaking"—
J. W. Crary, Sr., Bluff Springs, Fla.
Discussion of same.

NOTE: Each subject presented for consideration will be discussed by members of the Association when the speaker has finished.

TUESDAY EVENING, 8:00 P.M.

Second Annual Pow-wow under the auspices of the Philadelphia Brickmakers Protective Association, held in St. George's Hall, southwest corner Thirteenth and Arch Streets, Brother Murrell Dobbins Master of Ceremonies.

SECOND SESSION, WEDNESDAY, 9:30 A.M.

1. "Brickmaking in New England," address—
Geo. M. Fiske, Boston, Mass.
2. "Moulded and Ornamental Brick," essay—
James Taylor, Long Island City, N. Y.
3. "A Common Sense Talk on Brick and Brickmaking," address—John Cubbins, Memphis.
4. "Drying Brick," essay—
Edmund Webster, Philadelphia, Pa.
5. "Repressing Brick." discussion led by
J. A. Baggs, Bridgeport, Ohio.

THIRD SESSION, WEDNESDAY, 3:00 P.M.

6. "The Key to Success in Brickmaking,"
W. H. Brush, Buffalo, N. Y.
7. "Advantages and Disadvantages of Making Brick by Hand," address—
Jacob Dowler, Philadelphia, Pa.
8. "Some Lessons Learned in Thirty-five Years of Practical Brickmaking," address—
Hon. Geo. S. Oldfield, Norfolk, Va.
9. "The Stiff Clay Process," essay—
W. H. Alsip, Chicago, Ills.
10. Question Box.

FOURTH SESSION, THURSDAY, 9:00 A.M.

11. "Hints to the Inexperienced in Brickmaking" address— J. A. Reep, Knoxville. Tenn.
12. "Paving Brick, their Manufacture and Use," essay J. H. Calkins, Galesburgh, Ill.
13. "Burning Brick," address—
Thos. R. McAvoy, Philadelphia, Pa.
14. "The Dry Press Process," essay—
S. J. Rose & Son, Chester, Pa.
15. "Burning Dry Press Brick," discussion
Led by————
16. Question Box.

FIFTH SESSION, THURSDAY, 3:00 P.M.

17. "Evolution of the Brick Machine," essay—
Geo. S. Tiffany, Tecumseh, Mich.
18. "Experiments in the Manufacture of Fuel for Burning Brick,"—
A. J. Baker Denver, Col.
19. Question Box.
Report of Committees.
Miscellaneous Business.
Adjournment.

It has been thought best to make up the programme entirely from members who have not heretofore addressed the Association in a formal manner in order that the current of thought and experience may be broadened and deepened. While in this manner it is hoped to obtain "new blood," we are assured that those who have rendered such valiant service in former years will be with us and again lend their welcome voices and good cheer, joining earnestly in the discussions as of old.

HOTEL ACCOMODATIONS.

Special arrangements have been made for the entertainment of members and visitors with the Continental Hotel, located on Chestnut Street, corner of Ninth, which, it will be remembered, was headquarters during the National Builder's Convention, also with the Girard House, which is just across the street from the Continental, and the Washington Hotel, on Chestnut Street between Seventh and Eighth. All of these are conveniently located within a few minutes' walk of the Franklin Institute in which the convention will be held. Directly opposite from the convention hall is the Philadelphia

MASTER BUILDERS' EXCHANGE,

which by courtesy of their Board of Directors, will be thrown open to members and visitors during the convention. All are cordially invited to make the Exchange headquarters during their stay in the city. Those desiring it, may have their mail sent to them in care of the Master Builders' Exchange.

REDUCED RAILROAD RATES

Have been obtained from all roads composing the Trunk Line Association, the Central Traffic Association and the Southern Passenger Association which include nearly if not all, the leading railways in the Eastern, Central, Southern and Western States. Over all these lines a two-thirds rate has been arranged for on the certificate plan as follows:

HOW TO SECURE REDUCED RATES.

1. Each person desiring the excursion rate must purchase a first-class ticket either limited or unlimited, to the place of meeting, for which he will pay the regular fare, and upon request, the Ticket Agent will issue a printed certificate of purchase

2. If through tickets can not be procured at the starting point, parties will purchase to the most convenient point where such through tickets can be obtained, and repurchase through to place of meeting, requesting a certificate from the Ticket Agent at the point where repurchase is made.

3. Tickets for the return journey will be sold by the Ticket Agents at the place of meeting at one-third the highest limited fare, only to those holding certificates signed by the Ticket Agent at point where through tickets to place of meeting was purchased, and countersigned by signature written in ink by the Corresponding Secretary of the Convention, certifying that the holder has been in regular attendance at the meeting.

4. It is very important that a certificate be procured, as it will indicate that full fare has been paid for the going journey and that the purchaser is, therefore, entitled to the excursion fare returning. It will also determine the route via which the ticket for return journey should be issued.

5. Tickets for return journey will be furnished only on certificates procured not more than THREE DAYS before the meeting assembles and will be available for continuous trips only; no stop-over privileges being allowed on tickets sold at less than full fares. Certificates will not be honored unless presented within THREE DAYS after the adjourment of the meeting.

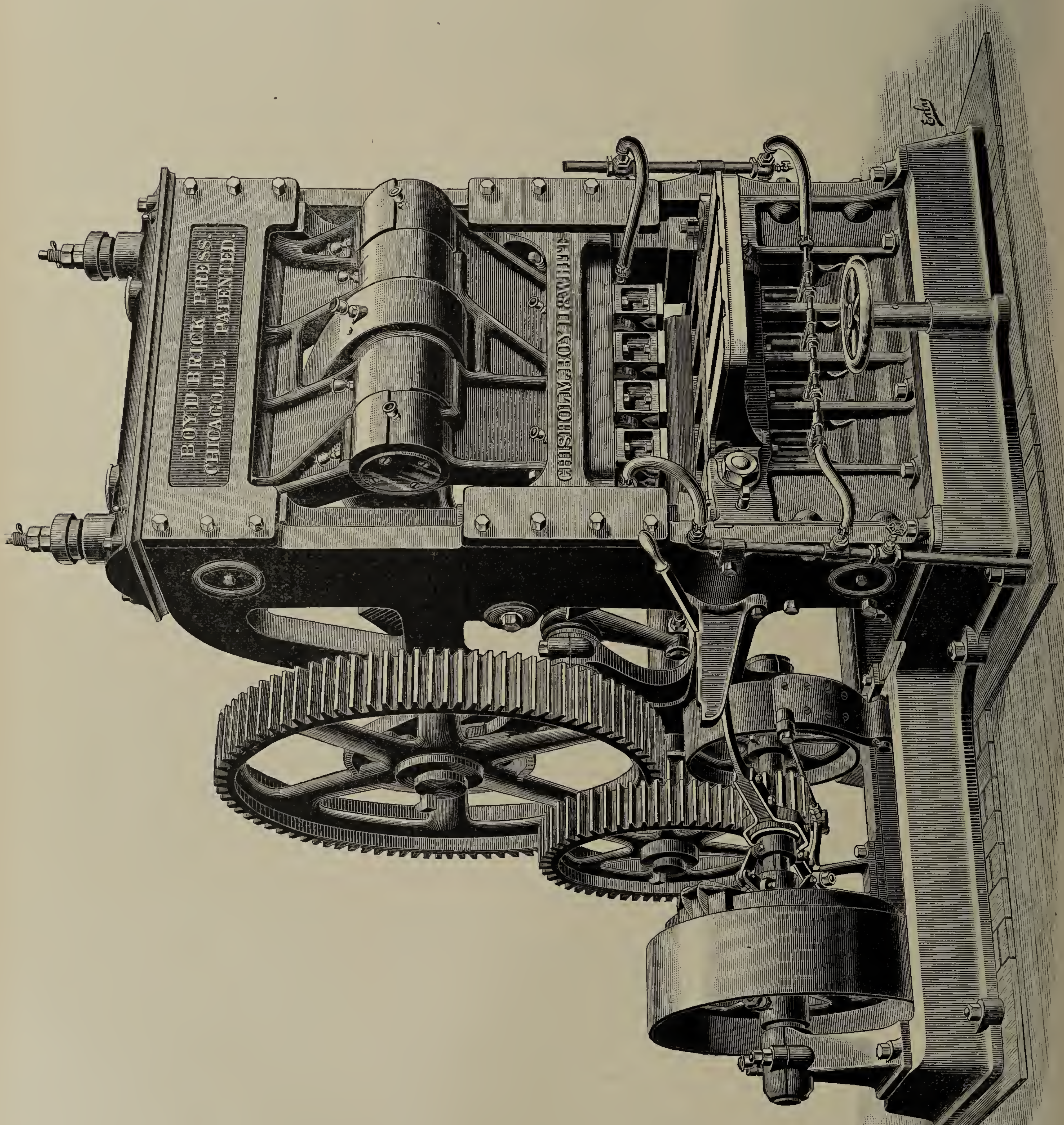
Should any station Agent fail to have a blank certificate a Receipt for the amount paid, stating that it is for one first-class fare and bearing the Agent's stamp should be taken and will enable the Secretary of the Association to obtain the reduced fare returning, and which cannot be done if no certificate or receipt is taken.

From all quarters—North, South, East and West—comes favorable and encouraging reports from our craftsmen who, without exception, express approval of both the time and place selected for our next annual meeting. There are unmistakable signs of increasing interest in the National Association and its work; many brickmakers who have not heretofore identified themselves with us are now joining the Association and will meet and participate with us in the work at Philadelphia. These indications of a constantly increasing interest on the part of individual craftsmen generally, is very gratifying for they bode a day of better things—a more rapid and general improvement in methods and products.

All who are interested in brickmaking, whether directly or indirectly, are earnestly invited to join the Association, attend the coming convention and lend their influence and assistance in the effort to advance the craft to the high position it deserves among the great industrial interests of this Nation.

Respectfully,

THE EXECUTIVE COMMITTEE,
by R. A. SPEED, *Pres.*
T. A. RANDALL, *Cor. Sec'y.*


BOYD BRICK PRESS.
CHICAGO ILL. PATENTED.
CHISHOLM BOYD & WHITE

THE BOYD BRICK PRESS.

Progress in the art of brickmaking during the last 20 years has developed the fact that superior brick can be made from clay by the semi-dry process. Those most experienced in the art claim that any clay that will make good brick by any process, will make better brick by the semi-dry process. The many failures made by inexperienced men in making dry pressed brick, led people to the conclusion that the process was a failure, except with certain clays having peculiar qualities. Hence prejudice has been strongly against the general adoption of making brick from semi-dry clay. In the writer's opinion, those failures were all caused by the lack of proper machines for pressing the brick and not knowing how the clay should be prepared, and how to burn the brick when made.

The man of progress, enterprise and energy who decides to adopt this process of making brick should not take the advice of men interested only in the sale of machines. He should find out where presses and machinery are being used successfully, go and investigate personally, see how the clay is prepared, how the brick are set into the kiln, what kind of kilns are used and how the brick are burned. He should observe carefully the staying qualities of the presses used, find out how long they have been in use, how many days they run in succession without breaking down or stopping for repairs, how many good brick they turn out regularly day by day, and at what cost per thousand. These things can be learned only by personal investigation. He should test his clay and know for a certainty that he can make merchantable brick from it, and then buy the best Press that can be got for the purpose, and use the kind of kilns that yield the largest percentage of perfectly burned brick. He should employ a man of experience in the manufacture of brick by this process to take charge of the works. If he does this, there need be no uncertainty in the business. It is only necessary to start right with the best machinery to insure success.

Advanced brickmakers are firmly convinced that the coming way of making brick is from dry clay. The preparation of the clay in most cases. is a very simple matter. Most of the successful Dry Press brickmakers harvest their clay during favorable weather. It is taken from the bank and allowed to dry in the sun and afterwards put under sheds and allowed to cure and become tempered. While some parties are successful in making good brick by using clay direct from the bank if sufficiently dry for the purpose, it is universally conceded that all clays are greatly improved by being allowed to lie for some weeks or months to undergo a sweating or curing process before being made into brick.

Inventors of Dry Press Machines have done much to foster and encourage this process. Innumerable machines for pressing dry clay have been patented during the last decade, and some date back more than fifty years. One of the latest in this class of machines is the joint invention of Mr. James A. Boyd, who has long been identified with the brick interests, and Mr. B. C. White, a mechanical engineer who stands second to none in the profession. This machine is known as the BOYD BRICK PRESS, an illustration of which is shown on the opposite page. This Press, which has had a large sale during the past season, is claimed by the makers to meet all the requirements in the matters of strength, simplicity and durability. We are assured by Messrs. Chisholm, Boyd and White that they have placed this season twenty-one of their Standard Presses, each being first subjected to a thorough trial by the purchaser before acceptance, and in no instance has a Press been rejected, nor has any failed to give satisfaction. These 21 Presses at their minimum capacity of 15 thousand per day, would produce 60 millions of pressed brick during the season.

The Press shown in the illustration, is their four-mold Press. It occupies a floor space of about 8 feet by 7 feet and is about 7 feet in height. A friction clutch pulley is used, so that the Press can be started and stopped by simply moving the lever. The gears are all machine molded and hence are practically noiseless. The pressing is effected by immense toggles of enormous strength. The side bars take all the strain in pressing the brick, so that the frame of the machine has only to support the weight of the operating parts. As will be seen, the whole is mounted on a heavy bed-plate which prevents any part from getting out of line, however severe the work or pressure. The weight is about 10 tons, and the power to drive is from 8 to 12 h.p. Its minimum capacity is rated at 20,000 pressed brick per day of 10 hours, while its maximum for making common building and paving bricks is estimated at 30 to 35 thousand on some clays.

A most important feature of Boyd's Brick Press should not be overlooked, viz.: The compound double pressure to which it subjects the clay, and the travel of the clay while under pressure down to the bottom of the mold and back. On account of these functions, peculiar only to the Boyd Press, the proprietors guarantee to put any kind of clay into perfect brick form without cracking and without the granulation so often seen on the surface of dry pressed brick.

We had the pleasure not long since, of seeing one of these machines at work. Its quiet, easy and majestic movement and its steady, regular work were certainly sufficient to excite the admiration of the most casual observer. Our readers will do well to thoroughly investigate the art of making brick from dry clay. Those desiring a fuller description of the Boyd Brick Presses, prices, terms, etc., are referred to the makers, Messrs. CHISHOLM, BOYD & WHITE, 185 Dearborn Street, Chicago, who, in addition to their 3 and 4 mold machines, also make one, two, six and eight molds.

FREAKS.

It is a fact known, perhaps, to not one in a hundred lovers of art in clay, that the renowned peachblow and dragon blood tints in Japanese ware that have been handed down to this generation are, no doubt, the result of pure accident, and the failure of potters to-day to reproduce them is not, as is commonly supposed, attributable to an "art" having been lost. By freaks of the fire, or, in other words, by inexplicable working of the heat of the kiln, effects are to-day being produced that are marvelous indeed.

The Rookwood pottery at Cincinnati, O., has one ordinary sized vase, not more than 8 inches high and 7 in diameter, and of plainest pattern, which no amount of money would buy. Its general color is a peculiar red, but if the vessel is moved so that the light strikes it on different parts of its convexity its color changes; and underneath a surface color is a pure gold tint. This piece is an accident. Nothing like it has been seen anywhere, and Prof. Morse and Charles A. Dana of the New York *Sun*, who spent a long while examining it, pronounced it the most remarkable piece of pottery ever produced.—*Ex.*

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN BY CORRESPONDENT. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Machine vs. Hand Methods.

Editor Clay-Worker:

Your Philadelphia correspondent, "Kali," deserves a little attention from some one, or all, of the advocates of machine made brick. His letter in November Clay-Worker, is remarkably well written, and his arguments more than fair, from his premises. I sympathize fully with him and the others, who feel like skinning the "Skimmer" for his absurd statements. I came very near taking a hand myself, but after reading it over twice, concluded that Mr. "A. Skimmer" was perpetrating a joke upon us. I am not certain yet, that he seriously meant to have us believe him.

"Kali" says: "It takes the very best, strong clay, to make machine brick properly and profitably." This may or may not be true. It all depends on who decides on the quality of the clay.

My experience in brickmaking has all been confined to Chicago and vicinity. Even the advocates of hand made brick admit (under protest, perhaps,) that machine brick *here* have been a decided success. Scarcely any of the very high, and large buildings, built here within the past five years are of other than machine made brick. I do not think a hand made pressed brick has been used in Chicago for five years, and yet I doubt if any practical brickmaker would call our clay "of the best," though some of that obtained near the Stock Yards is certainly strong.

I take it for granted that "Kali" is a young man who desires, and intends to keep abreast of the times, but he has imbibed, to some extent, the dogmatism prevailing among the brickmakers of a generation or two ago. Their position is, that because a thing has not been done it cannot be. I used the first Chambers' machine in this city, and we had a large number of "Kali's" here who insisted that the process was impractible. Some of the, then, most bigoted of their number are now the staunchest advocates of, and have achieved the greatest success in using the same machine.

The one conclusion of "Kali," that seemed to me to have been arrived at carelessly, was this: That "cheap machine brickmaking means reduced wages and more work for the labor." He could not have obtained any figures for such conclusions from any man in this locality, who uses machinery to manufacture brick. With the exception of the setters, wheelers and loaders, no man on my yard performs as much labor as the average of a hand yard. The three classes named all work by the thousand. The clay bank is ordinarily a place where hard work is done, but with the use of the steam shovel skill and care are far more requisite than strength. From the time the clay leaves the bank until the brick are taken charge of by the wheelers and setters, the most laborious work performed by any one is the lifting of one brick at a time.

As to the wages paid and earned, the average pay of the hands on my yard at Purington during the past season has been $2.52 per day. If "Kali" or any other hand brickmaker who makes only common brick can beat this record, let us hear from them. D. V. PURINGTON.

Chicago, Nov. 22d, '89.

Forms of Brick.

Editor Clay-Worker:

It is strange that among all the improvements in brickmaking so little alteration has been made in forms of the brick itself from the 4x8 rectangle. A difference in form is not difficult for the brickmaker and he is ready to make anything out of clay he can sell and the improvement must come from the builder or mason. And yet, the mason can make no radical departure from the everlasting rectangle until he has some other forms to experiment with. Both had better copy from the ancients, who used them of various forms and laid them in diverse combinations. Vitruvius, the most noted of Roman architects mentions bricks that were two feet long and 14 inches broad, and others 18x12 inches. Some were made especially for the construction of arches that were two feet in each dimension. Palladio, the great architect of Benice who lived in the earlier half of the 16th centvry says they would be made greater or smaller according to the nature and of the building designed, and also speaks with much favor of some Roman bricks made in triangular form which were made one foot square and 1½ inches thick and had two lines cut in it from angle to angle while fresh, which divided it into four triangles. They were said to take up less clay, were easier managed in the kiln and more convenient to handle in building. They were mainly used in building city walls for defensive purposes, for which they were perfectly adapted. These walls did not have a regular face like an ordinary wall, unless they were veneered for the sake of appearance, but the apex of the angle projected in one course, and the base in the other, and the wall when struck with the battering ram exerted a thrust diagonally along the length of the wall, so that they were very much harder to break through than if built with regular cubes. There is quite a hint here that would likely to prove valuable in wall construction where lateral instead of vertical pressure were required and unique or artistic combinations would follow a change in form that would cost much less in building than our regular rectangle. Much of the labor of fancy brick work could be accomplished as cheaply as common brick can be laid, were the forms of brick varied to suit and produced in sufficient quantity to make them cheap. H. C. W.

Yes, Reburn Them.

Editor Clay-Worker:

I am not a professional brickmaker, but have done something in the way of making brick. My information about the business, however, has been gained largely from the columns of the Clay-Worker. Further, I wish to ask if brick that have been burned already but not sufficiently hard and deep enough in color should be burned again—to harden more and give them a deeper color. I have as good a clay bank as there is on the Pacific Coast and commenced the manufacture of brick a few months ago. The first kiln was burned in five days and turned out hard enough, but pale. The second kiln was burned six days, had a splendid color, but not quite enough hard brick, Lately I have burned a kiln containing 130,000 brick, taking nine days to burn and there are not more than 20,000 brick hard enough and well colored. The others are pale and too soft. Is there anything that can be done to improve them?

I am also enlarging my yard and expect to use a dry floor soon, which will hold 45,000 or 50,000 brick. We intend to run during the winter. A repress is on the way and I will make as many repress brick as possible, the clay burning a splendid red color.

M. V. BRICK CO.

Wash. Ter.

[The brick referred to is evidently the result of unskillful burning. The fact that a portion of the kiln was hard enough and of good color is proof sufficient that if the other portion of the kiln had been alike well burned the brick would have been alike hard and high colored, unless the brick in different portions of the kiln were made from different kinds of clay. It is often the case in mining clay that one strata is mined and used, then a strata next below is used, the different stratas differing widely in their composition. One strata may be burned in much less time than another, and the color of the brick from different stratas may differ widely. It is usually best to mine the clay from top to bottom, mixing the different stratas thoroughly; unless it is desirable to discard one strata altogether or it may be desirable to use a particular strata to make a special kind of brick. If our correspondent is quite sure that his clay is uniformly alike from which the brick were made, then the trouble is in the burning. The heat has not been uniform througout the kiln. In the burning of the kiln, see to it that the conditions are uniform from the beginning of the water smoking to the close of the burn. Some valuable articles on burning have been published in recent numbers of the Clay-Worker. It may be well to read them them again and study them closely. Then exercise your best judgment in raising and holding the heat alike throughout the kiln.—ED.]

Continuous Brick Kilns—Their Erection and Management.

Editor Clay-Worker:

As promised in the October Clay-Worker, I submit an outline sketch of the ground plan of one of the rectangular continuous kilns in use in the neighborhood of Peterborough, England, burning pressed bricks made from shale by the semi-dry process, with such modifications as experience has shown to be improvements. In some of the Peterborough yards plastic wire cut bricks are sometimes burned in these kilns, but when they are combined they are not mixed with the semi-dry bricks, but separate chambers are used, because the plastic wire cuts require longer time and more coal to burn than the semi-dry pressed bricks. It should be clearly understood in every instance (unless otherwise named) where bricks are to be referred to by number, English sized bricks are meant, and not American.

The kiln is 101 feet 6 inches long, and 74 feet wide immediately above ground level, and contains 14 brick-burning chambers.

The chambers Nos. 1, 2, 3, 4, 8, 9, 10, 11 are each 24 feet long and 14 feet wide and hold 16,000 bricks each—or 128,000 in all.

Nos. 5, 7, 12, 14 are the same size, but as the corners are rounded off hold but 15,000 each—or 60,0000 in all.

Nos. 6 and 13 are 13 feet long and 14 feet wide, and hold about 10,000.

Total number of bricks when kiln is full—208,000.

The smoke chamber is 60 feet 6 inches long, 10 feet wide, and 9 feet high, and contains 18 vertical flues, each one being capped with cast iron valves, worked from the top of the smoke chamber by iron rods. In the smoke chamber there are two spare flues, which can be used, one for the boiler working the machinery, and the other for an extra down-draft kiln. These two flues have in addition to the valves in the smoke chamber vertical dampers outside the kiln wall to prevent cold air getting below the burning chamber floor when the flues are out of use. The smoke chamber walls are 3 feet thick with pockets as shown, the end walls being 18 inches thick. The smoke chamber is covered with a semi-arch, with two 4½ brickwork rings. On each side of the shaft an iron door is built in the arch to enable the burner to enter the smoke chamber should anything happen to the valves. These doors should be oval, and large enough to get new valves in should those in use break.

Chambers Nos, 5 and 12 have each two flues—the two flues are not absolutely necessary, but they are useful, and assist the burner in getting the fire round the corner.

The block, or division walls are each 18 inches thick, with six openings (the end chambers having four openings) in same 8 inches wide by about 2 feet 9 inches high, to enable the fire to travel from chamber to chamber in the same direction as the figures. The reason why the second chamber from the end is numbered 1 will be explained later on, when the burning is referred to.

The doorways in the inner portion of the external wall are 3 feet 3 inches by about 5 feet six inches high, and they widen out at an angle of 1 foot 6 inches as shown. The external walls are two 14-inch walls, with 14-inch fetter walls between, the outer wall acting as a buttress to the inner one.

The underground flues are 2 feet wide by 2 feet 3 inches high, with 9-inch brick sides, and covered with a semi-arch built in two 4½-in. rings. The openings into these flues for the smoke and steam, are shown in each chamber floor. The vertical portion of the flues in the smoke chamber are 3 feet in diameter, with 9-inch brick work around same.

The chimneys at Peterborough vary from 120 feet to 165 feet high, but this one will be shown 130 feet above floor level, experience showing this to be a very proper height. At ground level it is 4 feet 6 inches diameter inside, 12 feet outside, the outer ring being 14-inch and the inner ring 9-inch brickwork.

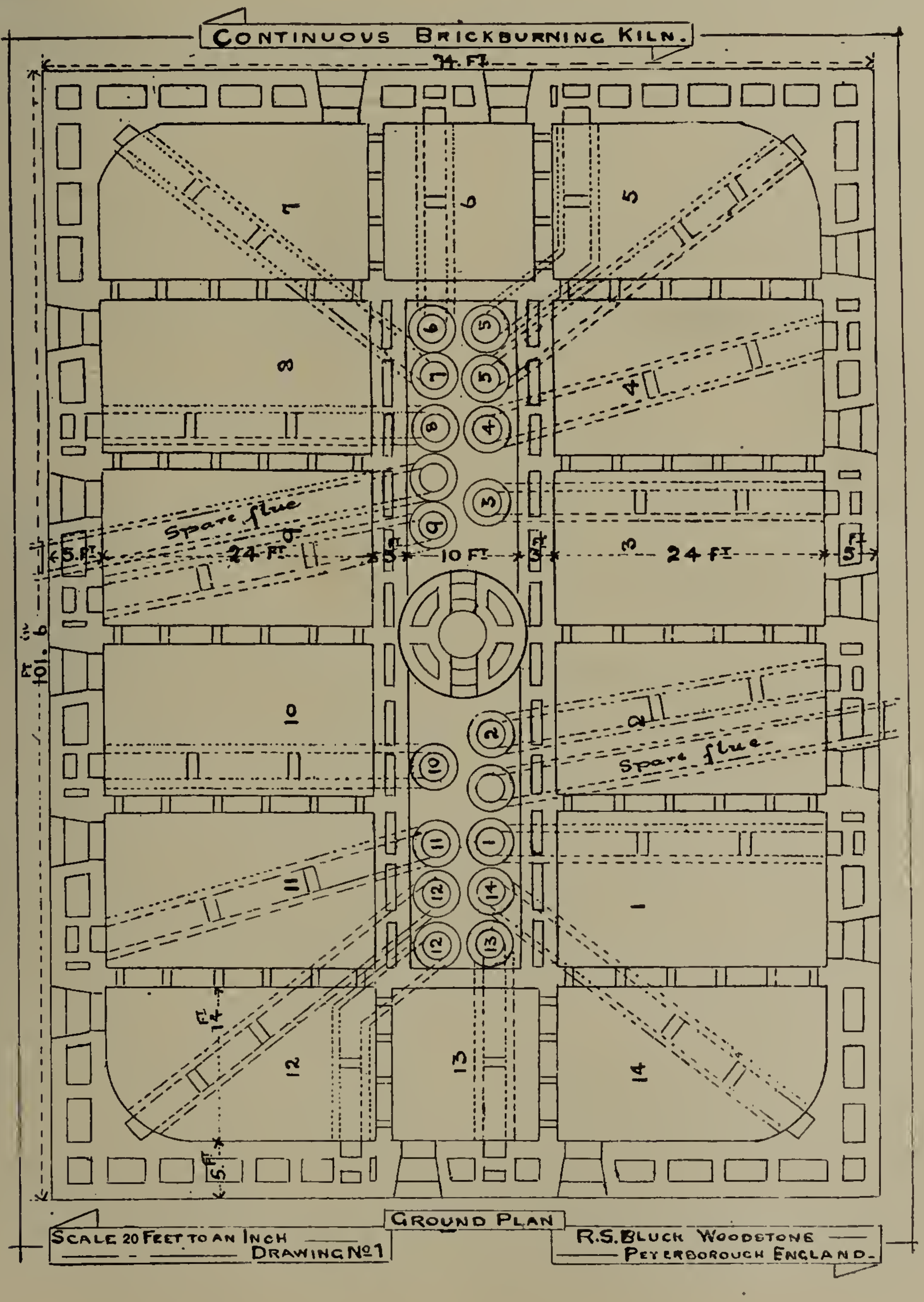
The pockets in the smoke chamber and external walls should be filled in with sand to retain the heat.

A further drawing will be given in the next Clay-Worker, and also instructions how to build the kiln from the commencement to the finish. Should any one not understand either the drawing or the description I shall consider it a pleasure to make the point clear on my attention being called to it.

Speaking in round figures the cost of a kiln similar to the one drawn, if built in England, would cost about £1,000, including the shaft and the ironwork.

A kiln of this description would take about sixteen weeks to build from commencement to finish.

At the time I am now writing a kiln of the same size as the one described is burning 120.000 bricks a week regular as as the clock goes round, and has been doing so for some months, but it is an exception to the rule, the average number being about 80,000 to 100,000 a week.



Brickmaking on the Ohio River.

Editor Clay-Worker:

I see that I have made a mistake in naming my subject. It refers simply to the fire and paving brick plants in the vicinity of New Cumberland, W. Va.

But as was remarked to-day, the various brick plants belonging to John Porter, the pioneer in the paving brick business, comprises nearly the entire output of paving brick in the "Panhandle." I do not know how many plants Mr. Porter owns or is interested in, but there are some five or six in sight of New Cumberland.

I have been here two days and have visited most of the plants, and would, if I had not seen so much, have been able to describe some one or more of the many interesting things, in a manner at least satisfactory to myself. I have been at some of the works the third time and am anxious still to make another visit.

Brickmakers as a rule know well the reputation of the clays in this locality. They have no superior, if equal, for street paving purposes.

I think about the first street paving brick of any note in the United States, were made here at the works of Mr. Porter, and many million brick are this year being shipped to distant cities, large orders going East as far as Philadelphia, Penn.

The clay is taken from beneath the coal measure. I was in one of the mines to-day and was particularly struck with the formation. The clay as found in the bank is very hard, resembling light gray limestone, except that it breaks with a smooth fracture. It is too hard to be handled with the pick, but is drifted and blasted the same as stone, when, however, it is exposed to the atmosphere for a few days it becomes comparatively easy to work. It is free from grit and stone and very plastic when tempered. It is easily molded into brick, but very hard to burn, requiring a very high temperature for vitrification, and hence, makes one of the best paving bricks that is to be found anywhere.

The depth of clay in the mines average from six to fifteen feet, and is found between a very good vein of coal above and solid rock below; above the coal is a layer of sandstone, which forms and supports the roof of the mine.

On entering the mine I was surprised to find the absence of props except at the entrance. I think one of the mines must now contain at least a mile of track and in all that distance not a prop is to be seen. But enough of the mine—what about the plant? I shall not attempt to describe all of them.

I was in one to-day which was a model, I assure you. The machine rooms were 10x90 feet. The dry room was 60x150 cet, all being three stories high. The first floor of the dry house was underlaid with tunnels supplied with heat at the lower end by a number of coal furnaces. The upper floors were slotted. Each floor would hold 30,000 brick. The brick are made on the lower floor of the machine house and elevated to the upper floor by means of a very complete system of elevators. The brick that I saw made yesterday were to-day being put in the kiln, which require about eight days to burn.

Until recently all the brick made at these works were shipped by water which worked very much against a large output. Recently, however, the Pennsylvania R. R. have run a branch from the main line, at the river, east of Steubenville to the works at and beyond New Cumberland. Since which time the brick interests here have taken a new impetus and is now one of the largest paving and fire brick centers to be found anywhere.

Besides brick, New Cumberland can boast of having the finest white ware pottery works in America, together with several large sewer pipe factories.

I am informed that there are no idle men here and not a saloon in the county.

I visited one of the most handsome churches here to-day that I have ever seen. It is complete and modern in every particular. One that any city could be justly proud of. But why do I mention the church? Because it was largely built by brickmakers. Mr. John Porter being chairman of the building committee and one of the largest contributors. When you visit the brick plants at New Cumberland do not fail to see the First Presbyterian Church.

The West Virginia Fire Brick Co., John Porter, president, have just begun the erection of the Eudaly square down draft kiln to take the place of their present old round down draft and up draft kilns. Mr. Porter now hopes to burn his entire output of fire brick into good paving brick and in this way be the better able to fill his numerous orders for this class of brick.

BRICKMAKING AT ST. JOSEPH, MO.

Until the past two years all brick made here were by hand. A few mud machines were set up and placed in charge of men who knew very little of anything about operating them and as a result, they were condemned and set aside.

Last year the St. Joseph Press Brick Company was organized with a dry press and Little Wonder machine, burning old style. The yard was run by contract, and under poor management lost money to operators. This year under the management of A. J. Snell, a practical brick man, who on assuming charge at once put in Eudaly square kilns and getting new men has been very successful and is now making brick equal to any St. Louis press brick, and the company will close its year's business with a handsome dividend, to its stockholders.

The Brick and Terra Cotta Company was organized last spring and is using the Acme machine, made by the Frey-Sheckler Co., burning in Eudaly kilns, and are making as fine a paving brick as known. This company have been remarkably successful, brick being sold faster than they can make them, and they claim to run from 50,000 to 60,000 per day with their machine. They are using the blue shale ground in dry pan, and we understand are now about to put in a Wolf & Colcman Drier.

The King-Hill Brick Company organized last spring, has the working of a good yard, having first-class material (blue shale). The Penfield machine has produced some beautiful specimens of brick, which when properly burned equal any St. Louis press brick. They have spent considerable time and money with a new kind of patent kiln, without very satisfactory results. Their water supply gave out early in the season; which has placed them at a disadvantage. With proper kilns and management this will be one of the best yards in St. Joseph.

These machine yards all claim they can put brick on the market at a handsome profit and sell for what the mud brick cost.

The hand molders already see the "handwriting on the wall," as the brick produced with machines and better clay are so far superior to theirs that the brick layers claim as soon as the supply is great enough they will lay no more mud brick when machine brick can be had.

We have now one street—S. Eighth—paved with vitrified brick burned in the Eudaly kilns and it is acknowledged by all to be the best material and best paved street we have in the city, and from now on no other paving will be used, is the opinion of all.

The city was badly treated by the Asphalt Company in its contracts, and that of itself has condemned asphalt as a paving material here. In fact, most all western towns and cities are putting in brick for street paving. It being much cheaper and more durable. W. A. E.

The Village Brickyard.

Editor Clay-Worker:

I desire to thank your correspondents who in the October and November issues of the Clay-Worker have had something to say for the enlightenment of seekers after knowledge as to the cost of machine and hand-made brick. But it seems to me our friends who run machine yards or make brich machines to sell are not doing themselves justice when they have left their whole defense to Brother Skimmer, of Iowa, with his little yard of a million capacity. And, besides, Brother Skimmer's facts are not properly tied together. I had stated there was a profit in hand-made brick "clear of every direct and collateral expense of $2.38 per 1,000 brick." He states there is a profit on machine-made brick of $2.97 per 1,000 brick, but admits in his article that wear and tear of machinery has not been deducted, and it is more than probable that interest on his investment has also been omitted.

This is a little on the plan that a man says he can get his bread and butter for seventy-five cents a week, and forgets to tell how much the meat costs, while in truth it is about two dollars more.

I enjoy my Brother Skimmer's sympathy for being behind the times. But the fact is I like to be behind the times, just about one day—it dont cost so much money to be a little conservative—there are lots of people who are smart in the morning and take right hold of the new idea, can see the end from the beginning like a cannon ball, red hot, for every improvement. And I am glad there is, for they teach us slow ones many things, but they don't often teach us how to make money. The fact is, by the time we see the good point they have made and are ready to take hold of said improvements, our smart friends are off on another tangent scattering the little money they have made to reach some more advantages. Well, I used to clerk for a machine business, and I'm pretty well booked upon labor-saving machinery, but I know a number of men who know ten times as much about it as I know or want to know, and can put my hand on several brother brickmakers among them who sunk their pile by being too smart.

Our market is more than half furnished by hand-made brick, and it is one of the largest markets in the country, and the little four-gang yard goes right on making brick and making money right under the same blue sky with the twenty-million brickyard across the way with its four machines and fifty-horse engines.

Perhaps some of our friends are not so good on figures as they are at making brick and do not see how easily the profit is to be accurately counted. If they care to look over gross figures of the village yard, possibly it may help them to present their figures for publication in the same or similar shape for ready comparison. In the following table column No. 4 being 5 per cent. on $11,000, uniformly each year; the balance of the column noted being for loss on tools, sheds, kilns and horseflesh.

Year.	Brick Sold.	Gross Profit.	Loss & Interest on Tools	Net Profit.	Profit ℘ 1000 Brick.
1881	$ 958,000	$ 3,188	$ 898	$ 2,290	$ 2.39
1882	1,179,000	3,543	832	2,711	2.30
1883	858,000	2,667	1,003	1,664	1.94
1884	1,055,000	3,158	936	2,222	2.11
1885	1,081,000	3,314	950	2,364	2.19
1886	1,468,000	3,591	1,332	2,259	1.54
1887	1,017,000	2,340	1,049	1,291	1.27
1888	1,067,000	2,552	801	1,751	1.64
	$ 8,683,000		$ 7,801	$ 16,552	$ 1.90

This loss may seem heavy to some who have not had to move about with their yards, but previous business experience had taught some very practical lessons as to the common errors of an inflated account of stock. A little calculation will show $3,401, or an average per 1,000 brick of 39 cents has entered into the cost of the brick in this way, and for interest $4,400, or an average per 1,000 brick of 50 cents. Here, then, we have for this period of eight years:

Net profit per 1,00 brick .	$1.90
Interest	50
Loss on Tools	39
Total Gross Profit ...	$2.79

It will be readily understood by a little attention, that all the prices per 1,000 are obtained by dividing the money by the number of brick sold to produce the profit, no money of course being earned on unsold stock remaining in the yard. It will no doubt be noticed that the money earned per 1,000 has decreased in the latter years. This is owing first to continued increase of wages paid per day, and to competition on contracts, some of the losses on tools being augmented by damages from heavy storms breaking up shedding.

Of course such statements as these are of a decidedly personal character, and it is not to be expected any one would make them in their community over their own signatures. But I feel the utmost confidence that our editors of Clay-Worker may be safely trusted to publish for the general good of the craft even details of business such as these.

VILLAGE BRICKMAKER.

A Wisconsin Brickmaker's Views.

Editor Clay-Worker:

Your correspondent, "Village Brickmaker," has given us figures as to his profits by making brick by hand, and they are certainly amply large—namely, $2.38 per thousand—to satisfy himself, and would be very satisfactory to many another fellow who cannot figure out the 38 cents, to say nothing of the dollars.

His claim that the use of machinery in brickmaking has not lowered the cost of production is fallacious in fact, generally speaking, and especially so, when the quality of the goods by the respective processes is taken into account.

We admit that a skillful hand-moulder can make a good brick, but no hand-moulder that ever "rolled a walk" can make as perfect a brick in angles and lines as are usually made by a good soft mud machine when the clay is properly tempered. When fire brick manufacturers used to make brick by hand they invariably had to repress them in order to get a brick that could be laid with a small mortar joint. Now, the larger part of all fire brick made in the country are made by machinery, and largely by soft mud machines and not repressed.

The question of the cost of making brick by hand or by machinery is hardly an open question, and is almost peremptorily settled by the exigency of the case. The immensely increasing demand for brick all over the country has called for a very large number of brick plants to supply that demand. If the old hand moulding had to be depended on, where could the skilled moulders be found? It takes time and persevering practice to make a good moulder, and many who have practiced for years are still second-class workmen. Machinery supplies the place of skilled moulders and does the work in a superior manner, and without that domineering, ignorant cussedness, that so many of the old time brickmakers had to grin and bear from their workmen. For the benefit and amusement of our modern brickmakers, many of whom, probably, never saw a brick made by hand, I will give two tables of figures, one by hand process, and the other by the soft mud machine process. In "ye olden time," in Philadelphia, the "stint" for a day's work for a "gang" (one moulder and two assistants—the mud having been previously tempered either by steam-power, horse-power or spade) was 2,700 brick. It is true they took care of them, and put them, when partially dry, in the storage or drying shed, but the brick "machine gang" does the same, that is, puts the brick on pallets, and the pallets in the racks, where they remain until called for by the wheelers.

Approximate cost of making 2,700 brick by hand, namely:

1 moulder......................................	$2.50
1 mud wheeler..................................	2.00
1 off-bearer..	1.00
Digging, carting, and tempering clay, say,...	1.38
	$6.88

Equals $2.55 per M.

Cost of making 40 M. per day by a soft mud machine and pug mill, namely:

1 engineer......................................	$ 2.50
Fuel for engine.........	3.00
1 man to feed pug mill..................	2.00
1 stacker..	2.00
1 dumper.........	1.75
1 sander (used sanding machine)..	1.50
5 truckers—$1.35............	6.75
1 hacker..	1.25
6 boys—$ .75................................	4.50
7 men getting clay—$1.50...........	10.50
2 horses (short haul)....................	2.00
	$37.75

Equals 95 cents, Per M.

Difference in favor of the machine made, $1.60.

I have no interest in any brick machine, and, farther, I would say, that the incidental expenses of a machine yard are usually much larger than on a hand yard. It will be seen that in the above estimates I have omitted cost of foreman, wheeling and setting, labor and fuel for burning, as these are the same in both systems. I may also add, that by the use of an "Auger" machine, where the clay is suitable, the cost of making should be from 20 to 25 cents per M. less than by a soft mud machine.

"Village Brickmaker," and the gentleman from Iowa, have had the courage to speak out in school and tell us their profits, and whilst we may admire their courage, and do not for a moment doubt or question their veracity, I must say, that our friend from Iowa has presented his case in such a way as to be misleading to the uninitiated. He gives the selling price at $5.25 per M., and the profits at $2.97. This leaves $2.28 per M. as the cost of making, including labor and fuel. This beats me. He does not say whether the prices named is for brick at kiln or delivered at the buildings. We may surmise he is foreman, setter, and perhaps, burner, and for all this he makes no charge. Possibly, he may have some boys who have given important help, and he has treated them with the same liberality that he has treated himself, namely, makes no charge. Now suppose he had some stockholders in the business with him, and he made one million brick at a profit of $1.50 per M. (a fair profit) and he charged $1,500 a year for his own services, there would be no rich profits in the business, and the stockholders would feel blue. If Mr. S. has included his own services in the figures he gives, then, as I said above, he beats me. I cannot make, set and burn the brick for $2.28 per M. Brickmaking is an honorable and growingly important industry and the craft should be careful not to misrepresent, even unintentionally. This has been done to an alarming extent, chiefly by machinery men and aspirants to positions as foremen, and has induced very many to engage in the business who have been bitterly disappointed.

For the benefit of those who may think of engaging in the manufacture of brick, let me formulate a rule by which to estimate the cost of production that I think will be found *tolerably safe*.

Estimate from the best data obtainable:

The cost of digging, carting, tempering, and making the clay into brick, say,	$1.00
Cost of setting, wheeling, say,	.40
Cost of labor in burning	.20
Cost of fuel	1.00
Incidentals	.25
	$2.85

Now multiply this by two and we have $5.70 per M., which you will find at the end of your fiscal year, after counting *all* items of cost, and wear and tear on plant, will not be far astray. BADGER.

Republica de Columbia South America.

Editor Clay-Worker:

Your notice of my name in the June Clay-Worker, has brought me many catalogues from the manufacturers of clay working machinery in the States, but they come rather late. I was compelled to send my order for a small brick machine to England. The catalogues and the advertisers in the Clay-Worker impress me with the breadth of doing things throughout the United States and the smallness of my own country.

You have more manufacturers of brick machines, than we have of clay workers of all kinds, here. My brick works are the only ones that are run by machinery in this capital city, (Bogota) and are, so far as I know, the only works of the kind in this country. I have one English machine which makes a daily output of 8,000 brick. Either the slow work of the workmen or want of capacity in the machine, or the poor management of the business, or altogether, I find it impossible to make more than one million brick a year. So that I want nine years to do the work that the Memphis Brick Manufacturing Co. does in one year. What I lack most in doing, is the burning. I have a square Dutch kiln and a round one, and good coal, but the brick of the higher layers are a pale red, and soft, or unsound, and the brick near the arches are rough and hard, and melted together in some places. I like the appearance of the Eudaly kiln, but I would like a small model of it, so I could see how it worked, but I dare not ask so much of him, neither do I know what it would cost, or what amount of money to send for his patent.

I burn fine pressed brick, with which the best points in the town are made. But I am compelled to put them in the middle of the kiln, and in a small quantity.

I sell the pressed brick for $28 per thousand in the money of this country, or $14 in American gold.

It will render me a great service if some one in the United States will tell me if they use mortar in the walls of the kilns to make them last longer and to keep in the heat and what is the formula for making the mortar.

RICARDO CALVO.

Burning a Kiln of Brick.

Editor Clay-Worker:

I have on several occasions been importuned to write an article giving my experience in brick burning. Having read the Clay-Worker very closely from almost its first number to the present time, and particularly the articles on the burning of clay wares, and having burnt a few kilns of brick, I have observed closely, making such notes as I thought important for future use to me in that line, I am still somewhat unprepared to say anything on brick burning.

One day I was closing up a kiln of brick. I had burned it as carefully as it could be done; had stood over and directed the firemen and the fires, and had kept a low heat, very much below the ordinary, and yet I found the arches had swayed over, and had apparently settled down under the heat that was only a little above a bright red. I was in a contemplative mood. The doctor came along, and in his friendly way asked me if I was shutting up the kiln for quits on it. He had heard some of the brickyard croakers and wiseacres rereport, which had been circulated, that Brix had failed on the burning of his kiln, or partially so at least. He was ready to condole with me if I was in need of sympathy. But I saw here a theme to make the case plain to him and answer all his inquiries in regard to the kiln in question.

I said: "Doctor, to my conception of the matter a kiln of brick being burned is very much like a man with a spell of sickness, with any of the epidemic or contageous diseases. You can diagnose his case, having a limited knowledge of the man, his habits, temperament and general health, you can approximate within a few days of the time when in all probability with good care, proper medication and good nursing he will likely recover. But should he have a weak constitution, be dissolute in his habits, and not likely to be well cared for, then you can tell very nearly what his chances are to die. And so it is in the case of a kiln of brick. A proper knowledge of the clay gives the burner who is the doctor in the case, the opportunity to exhibit his skill as an adept. The firemen are the nurses, who have the care and handling of the patient, and they are to be governed by the directions of the doctor. The fuel is the medicine.

"If the clay is of such a nature that it will melt under a low heat and crush, then it is like a patient with no constitution, and cannot stand heroic treatment. Then we had better send for a Homœpothist and a lazy nurse to manage this case. But with another kind of clay, which is represented by another sick man, the case is different.

"Again, the kiln of brick is like a sick man in this respect: If the weather is favorable, nurses attentive and watchful, and the patient properly medicated and nourished, he will quite likely recover. But if the sick man has been exposed to cool drafts of air, or if the nurse gives him his medicine every time he wakes up after a nap, or if his diet is not nutritious, or is neglected in any manner, the chances are against him; or if he does recover it is with a shattered constitution, weak nerves, and a general wreck physically. So in the case of the kiln of brick every thing must be favorable, or if not, at some point there will be a lack of success, either wholly or in part."

The doctor acknowledged the soundness of the reasoning, and said that there were plenty of men who felt competent to prescribe for somebedy else's ills who had no skill in preserving their own health. Many of the so-called or self-styled brick burners are ready to assume the place of doctor in the case, and direct and do a great many things that would not be done by the regular practitioner. They practice upon the patient, let him live or die; they ask a snug fee in either case.

The brick kiln is like a sick man in another respect. The ends of the kiln would represent his feet, and the arches his head. Usually in nursing a sick man we keep the feet warm and the head cool. This as a matter of course sounds unreasonable to advise that the arches of a burning brick kiln be kept cool, but what is meant is that the arches must be kept below the melting point, and not a particle above it. While the ends of the kiln with the cold walls and no fires, except from the sides represents the man's extremities. They must be warmed up by any means within the scope of the doctor's skill.

Favor these end arches with extra fire, close daubing of the cracks, and tight platting. A little fine coal run between the wall and the green brick will tend to help the case. The tight platting course and fine coal would be the blankets, and extra cover with a hot brick to each foot.

The doctor cannot be beside the patient every moment, or nearly all the time. He must eat, drink and sleep as other men. During his absence the nurses must give the patient close attention. The medicine must be administered until certain effects are produced, and not every one, two or three hours regardless of consequences. So with the fires, they are not to be made every so many minutes, but as needed. The fireman with his eye at the sight hole observing the heat of the arches, is the nurse with his finger on the pulse, noting the symptoms of the patient, his perspiration, respiration and temperature. When the heat has reached a certain stage or degree no more medication is needed except to hold the patient in that state until the doctor comes again. He may change his formula or prescription and the sick man begin to improve, and a cure is effected. BRIX.

Reply to "A. Paver."

Editor Clay-Worker:

Here are facts and figures for you, from a yard using continuous kiln, railroad track at kiln. Wages $40 per month for labor.

Semi-dry clay machine, 20,000 brick per day:

2 men in clay bank	$ 3.08
1 man in clay shed	1.54
1 " at pulverizer	1.54
1 " " machine	1.54
2 men, wheel from machine to kiln	3.08
1 setter	3.00
1 engineer	2.00
Coal and oil for engine	2.00
2 burners, one day, one night	3.50
5 tons coal slack, $1.80 per ton	9.00
60 c. per M. paid to remove from kiln to cars	12.00
Total	$42.28

Cost of brick per M. $2.11

I have told you what we could do with dry press, now see what we can do with stiff mud machine, 30,000 brick per day:

2 men in clay bank	$ 3.08
1 man at pulverizer	1.54
3 men, remove from machine to dry floor	4.62
3 men, remove brick from dryer to kiln	4.62
1 setter	3.00
2 burners, one day, one night	3.50
Coal for burning, 4½ tons, $1.80 per ton	8.10
30 c. per M. to remove from kiln to cars	9.00
Total	$37.46

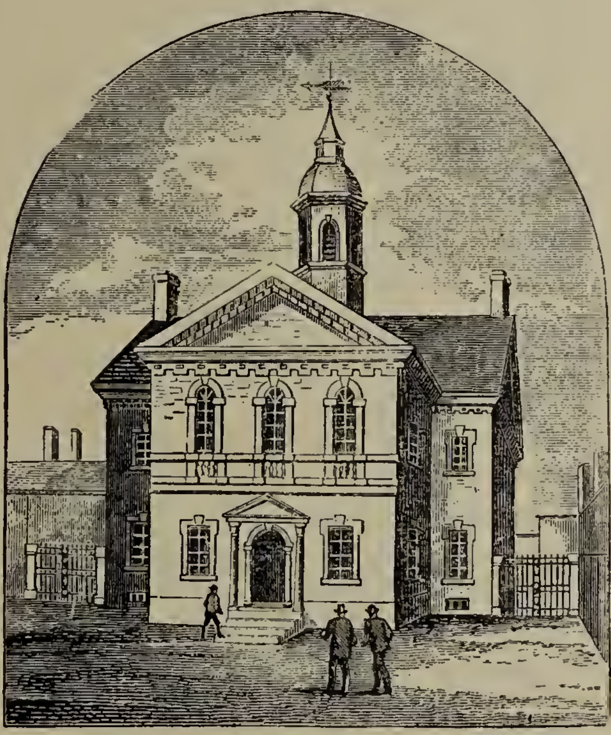
You can add your superintendent's and book-keeper's wages to this and you you will see it is below "A. Skimmer's" figures.

If the dry press brick are stacked up and not loaded on cars, it costs an additional 40c. per M.—stiff mud brick 30c. per M. Cherokee, Co., Ia. W. W.

CARPENTERS HALL.

Among the ancient landmarks in Philadelphia, none are more conspicuous, and none better preserved than Carpenter's Hall. It is situated in an open court south of Chestnut street, between Third and Fourth. It was erected by the Carpenters Company, which was organized in 1824, when the city was but 46 years old. The guild of carpenters and architects was the first association of labor in the city of which any history is preserved. They built the hall for the special use of the company and for the general accommodation of public meetings. It is a large two-story building with a plain brick front, and wings extending right and left. It is surmounted by a modest cupalo, and the whole structure is in a good state of preservation. The building was erected in 1770.

The first Continental Congress assembled in this Hall in 1774, when the possibility of an independent government was suggested, in the event that the greviences of the colonies were not redressed by the crown. This Congress was a most distinguished body, embracing such names as Washington, Henry, Randolph and Adams. A provincial mass convention met in the Hall in 1775, which issued the memorable Declaration of Independence.



CARPENTER'S HALL PHILADELPHIA.

During the Revolution, the second story of this building was used as a hospital for sick and wounded soldiers, and afterwards (1791) it was occupied by the first United States Bank. Some years ago the Carpenters Company determined to repair the building and restore it to its primative form and appearance, and preserve it as a memento of the past. Its strict maintenance of correct architectural proportions, with the rigid simplicity of Quaker taste, makes it one of the notable monuments of that epoch and that people.

AS OTHERS SEE US.

Messrs. T. A. Randall & Co.,
Indianapolis, Ind:

DEAR SIRS:—We were engaged in looking over the November issue of the Clay-Worker when your letter of the 21st inst. was received, and will take this opportunity of expressing our satisfaction with the number—not only with the handsome way in which it is gotten out, but with the fullness thereof. It reflects great credit upon you as publishers, and upon the earnest efforts being made for the betterment of the trade in which we are all so much interested.

The letter from Mr. Greer, of Mexico, in itself points a lesson that might be profitably studied by users of machinery 'at home," as well as in Mexico. Too, often it is the case that the failure to give a little intelligent study to the machine and to understand the purpose of its parts, results in a loss of dollars by the brickmakers, and an undeserved bad name for the poor machine builder.

To answer the question of your letter about our advertisement, we enclose new copy, but wish it to stay just where it is; on the first page of the first Journal of the Country representing our line, is where we modestly think we belong.

We are not making very much noise in our advertisements, but somehow we keep busy all the time, both in season and out, with all we can do. This "Thanksgiving Month" brings us a righ thick slice, with some raisins in sight.

Yours respectfully,
CHAMBERS BROTHERS' CO.,
per J. H. CHAMBERS, Gen'l Mg'r

COMING CONVENTIONS.

The various Tile, Brick and Drainage Associations meet in Annual Convention as follows:

Illinois—Springfield, Jan. 21st & 22nd.
Ohio—Columbus, Feb. 11 and 12, 1890.
*Michigan—Adrian, March 11 and 12,'90.

*The Michigan Convention failed to meet last year, on account of the removal and resignation of some of the officers who were expected to prepare the programme and make other necessary arrangements. What arrangements will be made to hold a convention this year, we cannot say at this time. The matter will be left wholly to those directly interested in the work in that state.

THE CLAY-WORKER

INDIANAPOLIS, IND., DEC., 1889.

Entered at the Post-Office at Indianapolis, Indiana, as second-class matter.

Terms of Subscription:

One copy, one year (in advance) . .	$1.00
One copy, one year (if not paid in advance)	1.50
Six copies "	5.00
Ten copies "	8.00

☞Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES furnished on application.

Correspondence on all subjects of interest to Clay Workers is solicited. Communications from practical men will always be welcome. Address all communications to

T. A. RANDALL & CO.,
14 & 16 S. Tenn. St., Indianapolis, Ind.

CLOSE OF VOLUME XII.

This number brings us to the close of Volume XII., and also to the year 1889. In making a retrospect of the work we find that it has covered a broad range of practical thought and experience. Much of this is the work of our correspondents and it is the outgrowth of daily practice and careful observation. In making the results of their labors a matter of record through the columns of the Clay-Worker they have wrought well for the craft.

* * *

The attentive reader has found much to set aside in the storehouse of memory for future use. So it is, indeed, what we do to-day has to do with our success to-morrow. What we build to-day in the erection of the valls of our characters as individual members of the craft,becomes the foundation upon which we build to-morrow. As brick follows brick in the building of the wall, so day follows day, and year follows year. And it is not more so in the building of the wall than it is in conducting the work of publishing a journal for the use of the craft. If we have made agood selection of material, and have exercised skill in the setting of it in place then our work on the structure brings to us the gratifying satisfaction of having wrought faithfully and well. Of this our readers and patrons are the better judges. There is, however, from our standpoint, much to commend in the material that has been furnished us. Each contribution made of the material at hand, has served a purpose in the building. It is all good, but here and there there are ornamental as well as useful panels, to which we point with pride. Panels that many of our readers have seen fit to commend highly—the best of terra cotta.

* * *

We close this volume and the year's work on the Clay-Worker with the confident assurance that what has been done during the year now closing will serve well as a foundation upon which to build the coming year or years. We cannot well close the work of the year, indeed we feel that it would be incomplete if we failed to give expression of our gratitude for the kindly and efficient service of our correspondents—they have our sincere thanks.

* * *

We would remember also our advertising patrons; their patronage has been liberal, and we appreciate the service. Indeed we have, as we think, a commendable pride in pointing to the advertising department of our publication. Our patrons in this department not only serve themselves in the wealth of their illustrations of machinery, but they make it instructive as well. Wherever the Clay-Worker goes, in this and in foreign countries (for we have a large foreign list) it is educative. It gives a view of the breadth of our operations in this country. It is educative in the sence that through this department the advancement of the craft is indicated. While the money side of this department is gratifying, yet there are other and commendable reasons why we have a pride in this part of our publication.

* * *

With the kindliest wishes for our readers and patrons we close the work of the year, full of hope for the future. Believing that we shall be able to render better service in the year and years to come, on account of our increased facilities, than we have in the past.

THE TWO GREAT FIRES.

Two great fires following in rapid succession at Lynn and Boston, Mass., involving losses amounting to many millions, bespeak a general flimsiness of construction unlooked for and unnecessary, at least in a city so old and wealthy as Boston. Buildings in cities are constructed too much for show and too little for endurance. We do not decry the ornaments, but we hold that the stability of a building should be the first consideration and display the second. European cities are not subject to the nearly instantaneous and complete combustion to which our American cities are subject. One really good building on a street does not serve to make a fire-proof city. A row of flimsy walls whether of brick, stone or iron will not stand when their interiors are filled with kindling wood, and there is no material except brick that will withstand the intense, furnace like heat developed by acres of such buildings. In truth, no ordinary wall of any material will escape destruction, for although brick is not altered by fire, the falling of roofs and floors usually destroy the walls by strain or impact.

* * *

There is such a wealth of fire-proof finishing material that the use of wood should be confined alone to door and window casings. Terra-cotta and encaustic wares with cements and iron or girders, are capable of superseding wood in almost every instance, and while it may cost a little more, and they do not cost much more, the reduction of insurance risks, the direct loss of from one-third to one-half of the investmen, the indirect losses by confusion in business and more than all in the total losses inflicted upon the stocks and fixtures, and business of a multitude of tenants, all go to make a sum that would twice build a burned district in the most thorough manner.

* * *

In the first place, walls are built altogether too thin. Whether the material be of brick or stone, matters little in this relation. That which escapes fire is destroyed by falling masses so that a furnace once started, the economical way of stopping it is to blow up a block or two in order to remove further fuel. The general use of iron is bad; even if nothing but girders and floor supports are made of it, heat will so expand it as to destroy a really fire-proof building. Where used, it should be incased in brick and cement, or if lightness is desired, the material known as "terra-cotta lumber" is admirably adapted to insulate it. But the whole subject is summed up in the mania to build a big, showy building where the money is only sufficient to build one of half the size if it were built as it should be, and in our larger, thickly populated cities, this subject should receive legislative attention, for it is unjust to the man who builds a really first class building, that it should be surrounded by blocks of fire-traps.

TRADE JOURNALISM.

A successful journal is one whose contents represent the thoughts, aspirations, and wants of its readers. An influential paper is one that by earnest effort and painstaking labor keeps in the advance of the popular mind and supplies it with the information it desires. People subscribe for a newspaperor magazine in order that they may become posted and keep posted in the work of the world. A trade magazine is only different from any other in that it collects, arranges and attractively presents the information peculiar to that trade. It is not that an editor is endowed with surpassing intelligence and with it condescends to impart it, but that he makes it his sole business to study the art he teaches, to study the art as it was practiced in other ages, or as it may now be practiced by other people —to sift out the wheat from the chaff—and to present it for the benefit and use of his subscribers. The vision of the editor is not more acute than his fellows but his standpoint is higher, and like the watchman on the tower he imparts the result of his vision to the people below.

⁂

But long time study and constant thought and practice makes him expert in the work and his judgment is educated so that his opinion on the subject he teaches is superior, and is so, because he has more material and a higher view. All this accounts for the great influence and power that an old and well conducted paper exerts, and people are influenced because they have confidence, and they have confidence because they have learned by long experience that the editors are painstaking workers and careful, accurate thinkers. It is only after a paper has been weighed in the balance of the popular judgment and not found wanting, that it may exert influence and not until it has lived and proved itself, can it properly aid the cause it represents. And this is even more true of the trade journal than of the political newspaper, because with the latter it is merely a matter of the ability with which political ideas already accepted are handled. But with the trade journal it must lead in the van of improvements that are yet in the future. It must be inventive and extract improvements out of the crudeness of the past. It must fertilize the minds of its readers out of the storehouse it laboriously collect. What it receives it must give out and it must give it out divested of all obscurity and rubbish or it will not be available. In short, it must represent the wants and aspirations of its patrons.

⁂

Such a paper is an influence and an invaluable aid to every person who directly or indirectly is interested in a given trade. It is equally a necessity to the man who takes out the clay or the man that makes bricks or the man who designs houses, or the artist who creates fancies. It is an essential vehicle for a multitude of wants. It aids the man who buys and the man who sells, and becomes by common consent the general agent of its class.

⁂

But a number of circulars bound into a colored cover and labelled with the name of a trade is not a trade journal, nor a newspaper, nor indeed, anything but what it really is, a large number of private circulars that are put out by advertisers in a sort of clubbing system in order to save postage. They carry no influence because the recipients of them know them to be mere advertising "fakes." Advertising is, indeed, a part of the modern paper, but it is an adjunct, not an aim nor an end. Business men use them not for a convenient way of stating what could be said in a letter, but for the influence and strength of the paper. It is influence that they buy and not "space." It is because they know that a paper is thoroughly read, that they advertise in it, and not because it offers inducements of the put-a-nickel-in-the-slot-order.

TERRA-COTTA ORNAMENTATION.

There is a house on North Meridian Street, in this city, that has a genuine architectural novelty. It is a residence of the prevailing airy type, with a portico constructed of terra-cotta, in the early Norman style. It is the portico which we term the novelty. The roof is supported by two enormous pillars of terra-cotta, supporting a circular arch of the same material. The pillars are relieved with a light festoon that climbs from the base to the capital and improves what would otherwise be a smooth red surface. It is one of the recent applications of terra-cotta to the higher orders of architectural expression which the writer has several times referred to as a *desideratum*, and it demonstrates the almost illimitable opportunities for art expressson in this universal and cheap material—clay. There is no other material that can compare with it in mobility, ease of production, or wideness of application. With proper handling, relative to harmony in a whole building, there is scarcely a situation it cannot be made to adorn, and with a more general use of it, its cost is comparatively so light as to be within the reach of the most modest house building.

⁂

People follow settled habits altogether too much when they begin to build. They do not look around them to discover if there be any material that would produce better effects and we may add, that furnishers of such material do not advertise their products widely enough and people go on in using wood in fancy shapes that cost more to whittle out than a good terra-cotta coating would, and then invite an annual outlay for paint, putty and repairs that in five years would entirely pay for the clay product, which will require nothing. We are glad to see this innovation on our streets, for its value as an educator in the art and manner of building is incalculable. Those who see "will take no other" when the comparison of beauty and costs are considered.

THE SPIRIT OF PROGRESS.

Messrs. Jonathan Creager's Sons, of Cincinnati, O., write us under date of November 28th (Thanksgiving Day) enclosing copy for their ad., which appears on another page and add: "We trust you are this day giving thanks because you are the head of the best clay-working journal in America, as well as for the other numerous blessings you enjoy."

We are indeed thankful for the large measure of success we have achieved, and "the other numerous blessings," foremost among which we reckon the hearty good will and friendship of our many patrons. The knowledge that our efforts to build up and advance our trade interests is appreciated, is, of itself, a mighty stimulus for still greater effort. Our chief desire is to exert the utmost influence possible for the betterment of the entire craft, and to that end we shall strive most dilligently.

MERIT WINS.

We have again been obliged to enlarge the Clay-Worker in order to accommodate our patrons both old and new. The gratifying feature to us is the fact that the increased patronage from old patrons comes unsolicited. We have resorted to no importunities nor have we made any effort or pretense of getting out a "special issue," yet this number includes eighty-two pages. Think it over.

HAS A GRIEVANCE.

T. A. Randall & Co.,
Pub's Clay-Worker, Indpls.

GENTLEMEN:—Will you grant me space in your journal to expose a piece of bare-faced plagiarism on the part of Mr. Chas. T. Davis, editor of your contemporary, *The Brickmaker*. On page 138 of the last (Nov. 15th) issue of that paper, under the title "Burning Paving Brick and Other Brick Requiring Toughness," I find, to my surprise, almost an exact copy of a large portion of my paper on the same subject, which appeared in the Clay-Worker for September, 1889, on page 158.

It is strange that a man of Mr. Davis's pretensions, and claims to high position, would so violate the rules and courtesies, (say nothing of law) of journalism and authorship, as to openly, and to all appearance, wilfully commit a literary theft.

This sounds harsh, but such action on the part of one claiming so much, deserves nothing less than bold denunciation. Any one comparing the two articles must see, that not only the thought, but, in part, the exact words of my article are appropriated, and this too, in face of the fact that my papers are copyrighted.

I heartily welcomed the advent of the *Brickmaker*, believing that it would prove an honest and fair co-worker with the Clay-Worker and aid you in your commendable efforts to elevate the clay-working craft. My disappointment is therefore two-fold, for neither you nor the craft can expect any benefit or aid from one who adopts the methods of a pirate.

J. W. CRARY, SR.

Bluff Springs, Fla., Nov. 22, 1889.

CLAY SHINGLES---ROOFING TILE.

We had the pleasure a few days since, in company with General Lew Wallace, of Crawfordsville, Ind., and John R. Elder and other capitalists of this city, together with Hon. R. B. F. Pierce and John S. Lazarus, officers of the I. D. & W. R.R. of making a run over this road a distance of 68 miles, to the town of Montezuma, at at which point, J. E. Donaldson and others have quite recently established the manufacture of his patent Clay Shingle or roofing tile (as it is commonly called.) Gen. Wallace's sojourn abroad as U. S. Minister to Turkey and his travels in other European Countries where clay roofing tile are in common use has interested him in the subject to an extent that he is quite ready to give material encouragement to the manufacture of clay tile roofing in this country.

Arriving at the works, which are situated near the I. D. & W. R.R. in the edge of the town, we find that the first kiln of tile has been burned and the men were emptying the kiln. The tile were fully up to our expectation—well baked, uniform in color, with little loss. Taking into account the fact that it is the first burn in a new kiln, the result is very encouraging, indeed. The machinery and appliances used, have in a measure, been improvised to demonstrate the feasibility of the enterprise, and some may not be the best excepting, however, the Raymond Repress.

The enterprise so far is a success exceeding expectations. The cost of manufacture is low enough to enable the manufacturers to put them on the market in competition with slate or iron roofing. Roofing tile if well laid, are good for centuries of use. Besides, there is not a roofing material in use that will afford such perfect protection against fire.

The Donaldson tile, while not being so heavy as other roofing tile, are admirably adapted to the making of a tight roof, one that will not allow the water of a driving rain to penetrate through the roof.

Men of capital are likely to take hold of this industry and manufacture the Donaldson tile upon a large scale. There is already a demand, several railway companies having expressed a determination of covering their stations and other buildings with this tile. In addition, inquiries are coming in asking when a supply can be had for private dwellings that are in course of erection or being planned for erection.

Mr. Donaldson deserves much credit for the energy displayed by him for the past five years in demonstrating in a small way the practicability of establishing such an important industry upon a broad basis.

A GREAT SAVING.

The Wassall Fire Clay Co., of Columbus, O., are using two of the Raymond Automatic Re-presses, the results of which seem remarkable. Two boys only are required to operate each machine, one of whom feeds the brick into it, the other removes and places them on barrows; 28,000 brick are thus made per day on the two machines. The same work formerly required 9 hand-presses and 27 attendants, making a saving of 7 presses and 21 men, not counting repairs of presses and dies, which in the course of a year is an item of considerable magnitude. The cost of re-pressing brick is reduced to a minimum, while the results are fully as satisfactory as by hand.

A HEALTHY GROWTH.

Bennett Bros. & Co., of Wellington, Ohio, manufacturers of the "New Quaker" Brick Machine, have had an increasing trade ever since they started in business, and have finally outgrown their present quarters, and will at once erect large and commodious shops for the manufacture of their machines. As many know, who have bought machines of them, it sometimes took longer than it ought to to get the orders filled. Although their shop was run to full capacity all the year they were never able to get enough ahead of their work to do business as they ought to be able to do.

At the same time they make a new firm, bringing into the business Allen and Sidnell, of Norwalk, Ohio, two of the finest machinists and general mechanics in Ohio, one of whom has been water works engineer for six years, and the other was superintendent of a machinery manufacturing company, and had nearly 100 machinists under him for seven years. The new firm, which will be known as the "Wellington Machine Co.," is under contract to work 40 to 75 hands for five years, so that it will be seen that the new firm will produce many more of the "New Quaker" Brick Machines and other specialties than they have in the past, and will be able to give promptest possible shipment of their machines, which are already in use in all parts of our large country.

While the "New Quaker" is known for its many valuable points it will be still further improved for the coming season, and the new firm promise a still better machine than they have put out before.

The officers of the "Wellington Machine Co." are as follows: Frank W. Bennett, President; J. R. Allen, Hydraulic Engineer, Vice-President; W. E. Sidnell, Mechanical Engineer, Superintendent; Thomas Kirk, Consulting Engineer; Harry S. Bennett, Treasurer; Chris. McDermott, Secretary.

When the British capitalists have bought up the leading manufactories of this country will they as violently oppose protective duties as they do now?

THE BROWN & HARROP MFG. CO.
Of Portland, Indiana.

Not quite two years ago this enterprising firm of young men established themselves as Clay Machinery manufacturers, at Portland, Ind., and in that time have earned for themselves a national reputation. Their specialty, the "Leader" Brick and Tile Machine, is proving remarkably successful and the demand for it is growing constantly as the brick and tile makers throughout the country become familiar with its merits. Though they already have a large and well equipped factory they are now unable to manufacture the "Leader" fast enough to fill the orders for them, and will have to build additional shops and increase their working force largely.

Their "Leader" Brick and Tile Machine is designed for large capacity and long service. It is very simple and strong, and calculated to stand any reasonable amount of crowding for large factories, and will answer equally well for smaller factories, by reducing its speed, and applying less power. It is constructed entirely of iron and steel, the bearings are all outside, and protected from dirt and grit. The frame is a solid piece of casting, entirely surrounding the gearing, making a very rigid support for the shafts. The metal is placed just where it is needed for strength and durability. The cylinder is cast in two pieces, making the augers easily accessible. The screw case and head are combined in one, and bolted to the cylinder. It receives the bracket and all dies to 12, inclusive. The augers are made of the hardest iron, and are carefully ground. The hopper is large, having an area of over one hundred and sixty-six inches. The end thrust of the knives is against the front portion of the frame, and of the screw at the rear end, thus dividing the strain equally on both sides of the frame. Chilled washers running in oil receive this thrust, and the wear is reduced to a minimum. The item of lubrication has received due attention. This machine is so well proportioned that less power is required to operate it than any other machine of its class. The machine can be operated with a good twelve horse-power engine, and do a fair day's work for a small or moderate sized factory. For larger factories, more power is required. As a combined brick and tile machine, the "Leader" is not excelled. The cutting tables are handy and easily operated.

Besides the "Leader," they also manufacture Tile Machines, Clay Crushers, Elevators, Etc., and solicit correspondence from all who are in need of anything in their line.

READ THE VERDICT.

What is Thought of the Potts' Horizontal Stock Brick Press by Those Who Are Using It.

Office of
CAMP & THOMPSON,
Manufacturers of
Summit County Sewer Pipe & Fire Brick,
Glazed Drain Tile & Hollow Brick.

C. & A. Potts & Co.,
Indianapolis, Ind.:

GENTLEMEN:—In reply to your letter of the 5th inst. would say the Brick Machine purchased of you last June has given entire satisfaction, and has done everything you claim for it to do. The Mould Sander we consider indispensable, and are more than pleased with it.

Very respecfully,
CAMP & THOMPSON.

Office of
THE VALENTINE BRICK CO.,
NASHVILLE, TENN., Oct. 11, '89.

Messrs. C. & A. Potts & Co.,
Indianapolis, Ind.:

GENTLEMEN:—I take great pleasure in referring to yours of the 5th, regarding the HORIZONTAL STOCK Brick Machine purchased of you last spring. Our plant is a new one and we have tried various vertical machines, as well as the Dry Press, and all of them have proven entire failures in our clay. The clay is of a very sticky nature, and the general impression among brickmakers was that the clay would not make brick. The plant was on the very verge of being removed to another location, when your machine was brought to our notice, and we decided to give it a trial. After removing the old machinery and putting yours in position, and starting the same, we were convinced that the fault was not in the clay, but in the machinery we were using. After a thorough trial we were convinced that your machine would do all claimed for it. We work the clay direct from bank without crushing or pulverizing, and are now making brick that dry and burn without a particle of loss from checking or cracking as heretofore. The great pugging capacity, on which depends the success of manufacturing, drying and burning, the Horizontal Press feed and its immense strength for working the clay stiff, and the Adjustable Press box, are points which every brick manufacturer should examine into. We are more than pleased with the machine in every particular, and would recommend it to every Brickmaker, who desires to get first-class results. With many wishes for your success with the Horizontal Machine, as I firmly believe it the best machine for the trade now offered. I am

Very respectfully yours,
GEO. FRIES, Supt.

DENIES THE ALLEGATION.

Office of
ANTHONY ITTNER,
(Successor to Ittner Bros.)
BRICK MANUFACTURER.
Yard: California Avenue and Sidney St.
ST. LOUIS, MO., Nov. 9th, 1889.

NOTICE TO BRICK MANUFACTURERS.

Certain unscrupulous persons interested in the sale of brick machinery have falsely represented that I am pecuniarily interested in the sale of the Andrus Brick Press, four of which I use at my works in St. Louis.

I deem it due to the manufacturers of the Andrus Press to contradict such false statements, and I hereby state positively that neither myself nor my brothers have ever been interested or received one dollar's benefit from the sale of these machines. Our recommendations of the Andrus Press are due to its merit and the honorable course pursued by its manufacturers in the production and sale of reliable first-class press brick machine. I use two of these machines to make my common pressed brick and during the past season two of these machines have produced ten millions of bricks.

I use one machine for ornamental and one for face or stock brick, producing all that are required both in quantity and quality. The Andrus Machines at my works run with the regularity and precision of a good clock. They invariably make an even, pressed, perfect brick, unexcelled by any produced by any other machinery.

The Andrus Press is constructed upon the very best principles and I have found it to be all it is recommended to be by the manufacturers.

ANTHONY ITTNER,
Successors to Ittner Bros.

S. K. Fletcher, of the well-known firm of Fletcher & Thomas, Indianapolis, Ind., has been confined to his home by sickness for several days but now thinks he will be able to attend the coming National Brick Manufacturers' Convention.

EDITORIAL NOTES and CLIPPINGS.

A pottery is to be built at New Ulm, Minn.

A brickyard is to be built at Table Reck, Neb., by Beatrice parties.

The Troy (N. H.) Brick Co. had a small fire at their yards recently.

Egerton & Ford, Louisburg, N. C., contemplate starting a brick yard.

The Minnesota Brick Co., of St. Paul, has increased their stock to $100,000.

R. J. Gurnell is using oil at his yard near Port Ewen, N. J., very successfully.

The Galesburgh (Ill.) Pressed Brick Co. will build additional kilns and a dry shed.

The Diamond Brick Works, at Layton Station, Pa., were burned recently. Loss $7,000.

The North Hampton (Pa.) Brick Co. has been incorporated with a capital of $100,000.

The Atlantic Brick Co., Rossville, L. I., N. Y., are looking for a brick burner and boss setter.

Jno. Welles, Washington Court House, Ohio, will probably build tile works near Dayton, Tenn.

W. H. Nesbit is enlarging his brickyard at Cerrillos, N. M., and will fit it up to run the year round.

The Purington-Kimbell Brick Co., of Chicago, will increase their capital stock from $100,000 to $200,000.

Streator, Ill., has large beds of excellent clay, and wants a brick and tile works started to utilize it.

Canandaigua, N. Y., wants a large brick yard established there. They have an abundance of excellent clay.

The Spring View Brick & Tile Co., of Puyallup, Wash., has been organized by Geo. E. Atkinson, and others.

The Meridian, Waterbury & Connecticut River Railroad Co., think of starting a brick yard at Cromwell, Conn.

Ten of the leading brick manufacturers of Chicago, have subscribed $3,750 to their Worlds Fair guarantee fund.

Chillicothe., Mo., is thought to be an inviting site for the location of a pottery. There is an abundance of fine clay there.

The Peoria (Ill.) Brick and Tile Co. has been incorporated by William A. Fritchman, Geo. Spagle and S. O. Corera. Capital, $25,000.

W. J. Ferguson, Waterbury, Md., intends starting a Terra Cotta Lumber Factory near there, and wants machine catalogues, etc., etc.

The Connecticut brickmakers have had a very unfavorable season, the output for the entire state will probably fall 15 per cent. below that of the previous year.

The Northwestern Brick and Tile Association of Chicago, has been organized by H. Blaisdell, formerly of Indianapolis, M. Pollasky and W. F. Chandler, of Chicago. Capital $200,000.

Wilferd Twinch and others contemplate starting a machine brick yard at Spokane Falls, Wash., and would like to receive prices on machinery, etc., for a plant to make 50,000 fire brick a day.

The large and finely equipped vitreous china works of Knowles, Taylor & Knowles, at East Liverpool, O., were totally destroyed by fire Nov. 18th. Loss $250,000. Insurance $30,000. Will be rebuilt.

The *American Geologist* gives an account of the remains of an ancient glacier in Pine Creek Canon , Idaho. It is said to be quite accessible and will furnish an almost inexhaustible supply of ice. It will probably be mined for practical use, and distributed as a commercial article. This will be a new feature in the mining art.

Edison, the great electric wizard, says the scientific problem of this age is some cheap method of evolving electricity. A dynamo gets scarcely 50 per cent. of the power of the engine that drives it; and the engine gets but 10 per cent. of the power liberated in the combustion of the coal. The dynamo only gets about five per cent. of the force liberated.

Those who answer advertisements in the "Wanted, For Sale, Etc.," columns are sometimes disappointed because no reply is made to their letter. In such cases it is to be presumed the advertiser has made arrangements satisfactory to him and therefore thinks it unnecessary to reply. In no case are we responsible, for all such letters are always forwarded promptly on receipt at our office.

In some parts of the country, the crops of this year were damaged by excessive rains in the early part of the season, and in other parts by summer drouth, but both misfortunes taught us the lesson that tile drainage and deep cultivation may, to a great extent, counteract the influence of unfavorable seasons. Well drained land, deeply tilled did not suffer serious damage from either extreme.

The Henry Martin Brick Machine Mfg. Co. request us to state that there are now twenty of their machines in use in and about Philadelphia and several more have been ordered for the coming season, which they think is an evidence of the reliabiliability of the Martin machine. Their general business has been good throughout the year while their fall trade has exceeded that of any former year.

Messrs. W. B. Harris & Bros., of Zanesville, O., who have a national reputation as manufacturers of fine front brick, in addition to other improvements recently made, have put in the Raymond Automatic Repress, dispensing as far as possible, with their numerous hand presses. They expect to make the best quality of work on the machine and fully satisfied themselves as to this point before purchasing.

Fletcher & Thomas, Indianapolis, Ind., have just received an order from one of their California customers, for the fifth complete Heavy Steam Power Quaker Brick Machine outfits. Nothing could speak in higher terms of the reputation of brick machinery than such orders. They have also just sold a brickmaking outfit to a party in England. They report the prospects for the coming season as growing more flattering every day.

Preliminary surveys have been in progress during the last summer, by United States engineers looking to the irrigation of the great plain east of the Rocky Mountains, formerly known as "The Great American Desert." To accomplish this, it is proposed to store the waters of the tributaries of the Missouri from the Yellowstone to the Arkansas in their upper course, and distribute by canals. They must, however, make a proper account of the enormous evaporation in the dry atmosphere of that region.

I. & M. Wolff & Coleman report a satisfactory and growing demand for their Driers. They are now building a Drier for W. C. Hill, at Seattle, Washington, to dry 50,000 brick, also one for Drummond & Plumridge at Seattle, to dry 50,000 brick. They have just contracted for three Driers for the Meridian Brick Co., of Tacoma, Washington, for the Glens Falls Terra Cotta Brick Co., of Glens Falls, N. Y., to dry 15,000 soft mud brick and 8,000 repressed brick, and are now building a Dryer for S. Graham & Co., of Bordentown, N. J., to dry 30,000 brick.

It is said that the Red Lake reservation, in Northwester Minnesota, on which the Indian title has just been extinguished, will give $25,000,000 worth of pine lumber, but it is estimated that it will be all consumed in five years to supply the demand for lumber on the treeless plains of Dakota and Northern Montana. In twenty years after that, the cottages built with it will have disappeared, and there will be no more pineries, from which they can be replaced. But fortunately there is an inexhaustible supply of clay there, from which the best of all building material, brick, can be made to supply the coming generations with imperishable structures.

It will be seen by reference to the ad. of the manufacturers of the Champion Brick Mold Sanding Machine (on the outside of the back cover) that they have shown good faith in their Caution to the public against manufacturing, using or selling infringing machines. We, of course, do not take sides in this controversy, but we await the decision of the Court to determine whether infringement exists or not. Manufacturers who strive to improve mechanical aids, are certainly entitled to the privilege of appealing to the Courts to determine their exact rights, and a friendly contest of this character is beneficial, as the decision is reliable information to the trade as to where they must go to get desirable machinery. May the right man win, is our wish.

In anticipation of an increased demand for Tank Furnace Blocks, the Christy Fire Clay Company, of St. Louis, Mo., has just completed some very extensive additions to their former large plant and to-day they have the most complete fire clay establishment in the United States. They have erected a large brick building exclusively for the manufacture of tank furnace blocks, this builing is equipped with all the latest improved Clay Working Machinery which has been constructed especially for the Christy Fire Clay Company, the building also has a steam drying floor, covering an area of 18,000 square feet. The works of this Company cover six acres of ground in the southwest corner of their extensive tract of 260 acres, situated on the Morgan Ford Road in the city of St. Louis. The Company has unequalled switching and railroad facilities which enable them to turn out Tank Furnace Blocks of any practicable size, they load direct from the kiln into the cars. Messrs. Jno. Johnson & Sons, of Franklin Square, New York, have just sold the Christy Fire Clay Company six improved clay presses, which are to be put up at their works in January.

The Columbia Falls Brick Co., Columbia Falls, Me. The officers of the company are: President, E. A. King, Boston; Treasurer, H. R. Thompson, Newton, Mass.; Clerk, Clarence Hale, Portland; Superintendent, H. W. Bucknam, Columbia Falls. The company has purchased 60 acres of clay land and 84 of wood land. The clay is entirely free from impurities and weighs 150 pounds per cubic foot. A brick made from this clay will weigh one-third more than an ordinary brick. The clay is well suited for terra cotta manufacture. The Company have at present a 40 h. p. engine and a 100 h. p. boiler, Penfield's Soft Mud Iron Machine, Pug Mill and No. 4 Crusher. The Company is turning out 36,000 brick per day. The present building is 40x65 feet, the dryer will be 60x150 feet. A kiln of 200,000 is already to burn. When complete there will be 16 kilns (patent). The plant will cost $50,000 or $60,000 when the present plans are carried out, and the plant will be the largest for making bricks in New England.

DINING CARS.

Indianapolis to St. Louis via Vandalia Line, Train No. 1, leaving Union Jtation, 11:55 A.M. daily.

It is by the adoption of improved devices for promoting the comfort of passengers, that this popular line has kept fully abreast of the times, and is always found in the front rank. Everything relating to comfort, ease, health, elegance and ministration to luxurious tastes, including ventilation, lighting, strength, safety, mechanical efficiency, ornamentation, superiority of appliances for supplying food or securing rest or sleep, has received due consideration on a marvelous scale, regardless of expense. The Vandalia affords the traveling public every class of cars, from the latest improved day coaches to the luxurious parlor, sleeping and dining cars. As soon as a want or chance of improvement is indicated, the managers are equal to the emergency, and vigorous efforts are speedily made to supply the new demand. The Vandalia is patronized by all classes of travel; is therefore endorsed by the public, hence its popularity is universal.

THE F. F. V. TO PHILADELPHIA.

The finest train between the West and the East, is the F. F. V. (Fast Flying Virginian), over the Chesapeake and Ohio Route, which runs to Washington, Baltimore, Philadelphia and New York, leaving Cincinnati at 6:30 P.M. and reaching Philadelphia at 6:15 the next evening. These facts are of interest to those who will attend the coming Annual Convention of the National Brick Manufacturers' Association, which meets in Philadelphia, December 10. The train leaves the Union Depot, Cincinnat, upon the arrival of trains from Indianapolis, St. Louis and the West.

This train has won fame for the new management on the C. & O. It is an elegantly and luxuriously appointed limited train, vestibuled from end to end, heated with steam from the engine and lighted with electricity. It runs through solid to New York, and is the only vestibuled limited with through dining car between Cincinnati and the East. The dining car is under the management of the Pullman Company and is equipped with every appointment of a first-class hotel, the menu comprising every delicacy. Meals are served *table d'hote* at the uniform price of $1.00

The C. & O. Route to Philadelphia is the most picturesque and beautiful in North America. Its charms are as varied as they are striking: The Ohio River for 160 miles, then the wild and roaring New River in its rock-ribbed canons, its banks lined with blazing coke ovens, then the towering Alleghanies and the soft Blue Ridge. All these and many other features engage the traveler's attention.

The rate of fare to the Convention will be one and one-third fare for the round trip. For information as to rates, etc., apply to agents of connecting lines, or address H. W. Fuller,
Gen'l Pass. Agent, Cincinnati, O.

THE ROUTE TO PHILADELPHIA.

The Baltimore & Ohio R. R. offers egates to the National Brick Manufacturers' Convention the most attractive route to Philadelphia and at rates lower, from most western points, than can be obtained via any other through car line. Pullman's Palace Sleeping Cars are run through without change, to Philadelphia from Chicago, St. Louis and Cincinnati. In addition to the picturesque scenery along the line of the B. & O., all its trains between the East and West run via

Washington. Congress will be in session during the time of the Brickmakers' Convention, and as many of the delegates will desire to visit the National Capitol, either en route to or returning from the Convention, we would advise them to travel by the B. & O. R.R.

CONVENTION NOTES.

Are you going to the Convention? Is a question that every brickmaker in the land should answer in the affirmative unless prevented by unsurmountable difficulties.

From every direction comes the good news that the craft is alive to the importance of the coming annual gathering, and there is every reason to believe that the attendance will be very large—much larger than ever before.

We have much sympathy for all craftsmen who are unable to be in Philadelphia, Dec. 10th, 11th and 12th, when the brethren will once more meet together and commune for mutual profit and pleasure. All who can come will surely harvest a rich store of both. No enterprising brickmaker can afford to miss the fourth annual convention of the National Brick Manufacturers' Association.

We confidently anticipate the pleasure of seeing many charter members at Philadelphia. Indeed we will be grievously disappointed if we do not feel the warm hand grasp and fraternal greeting of a majority of those who first wore the National Association's badge in Cincinnati, in 1886. Come all who can and partake of the fruit from the tree of knowledge then planted. Come, and wear upon your breast that emblem of honor, a charter member's badge.

NEW INVENTIONS.

The following is a list of patents appertaining to brick, tile, terra cotta, sewer pipe, pottery, etc., and the machinery used in their manufacture, issued since our last number:

412,399. Brick Kiln—F. P. Meyenberg, Chicago, Ill.

412,230. Machine for Repressing Brick—Baird & Cornell, Thetford, Ont., Can.

412,321. Clay Reducer—W. Burkman, Los Angeles, Cal.

412,127. Composition for Base Brick—E. Bertrand, Kladuo, Bohemia, Austria.

412,858. Brick Wall—J. McMurty, Lexington, Ky.

413,482. Brick Yard Cultivator—A. J. Bates, Summunduwot, Kansas.

413,358. Burning Clay for Ballast—W. F. H. G. Butler, Kenosha, Wis.

413,170. Stoneware Pipe Coupling—H. B. Camp, Cuyahoga Falls, Ohio.

413,388. Pulverizing Machine—W. H. Howard 'Bath Co., England.

414,329. Brick Sanding Machine—Leonard Roll, Wilkesbarre, Pa.

414,716. Terra Cotta Construction—John Lynch, Washington, D. C.

414,719. Tile—Adolph Metzner—Hamilton, O.

415,407. Rack for Drying Brick—James Dennis, Newington, Conn.

415,482. Brick Kiln—John H. Thissen and Millard M. Arnold, Omaha, Neb.

415,270. Brick Machine—Charles H. Horton, Wellington, O.

415,642. Building Block or Brick—Arthur J. Judge, St. Louis, Mo.

415,773. Brick—George M. Fiske, Newton, Mass.

414,055. Brick Machine — Lewis B. Kennedy, St. Louis, Mo.

413,834. Detachable Head for Brick or Tile Machines — Edmund Rothwell, Little Falls, Minn.

413,897. Brick for Furnaces—Virgil W. Blanchard, New York, N. Y.

NEW ADVERTISEMENTS.

Fletcher & Thomas,
Brick Makers' Supplies.
Chambers Bros. & Co.,
Brick Machinery.
H. Brewer & Co.,
Clay Working Machinery.
Geo. W. Sharer,
Brick Driers and Kilns.
Chisholm, Boyd & White,
Dry Press Machinery.
I. & M. Wolff & Coleman,
Brick Driers.
Fate & Freese,
Brick and Tile Machinery.
Nolan, Madden & Co.,
Clay Working Machinery.
A. H. Newton,
Brick Mould Sander.
Jonathan Creager s Sons,
Brick Machinery.
National Barrow & Truck Co.,
Brick & Tile Trucks, Barrows, &c.
Wellington Machine Co.,
Brick Machinery.
Aerated Fuel Co.—Method of Burning Brick, Etc., with Oil.
Small Ads., "For Sale, Wanted, Etc."

The Winkle Terra Cotta Co., St. Louis, Mo., has been incorporated. Capital, $40,000.

Salt Lake City, Utah, is thought to be a fine point for the location of a brick plant of large capacity. The demand for brick is much greater than the supply.

The Art Tile Works in Chelsea, formerly owned by John F. and John G. Low, have passed into the hands of a corporation composed of twenty-four gentlemen interested in the manufacture of tiles.

CAME TOO LATE.

We expected to continue our "Brick Yard Sketches" and give, in this issue, descriptions and illustrations of several prominent yards but the engraver disappointed us, the cuts not arriving till our "forms" were "made up." They are now on hand, however, and will be laid before our readers in a subsequent issue.

TO FLORIDA.

Commencing Monday, December 2, the Pennsylvania Line (S. M. & I. R.R.,) with its train leaving Indianapolis at 7-35 a.m., makes direct connection at Louisville with the L. & N. fast train which arrives at Jacksonville, Fla., 1:55 p.m., the following day. Pullman sleeping cars are run through from Louisville to Jacksonville. Therefore, the only change of cars necessary is at Louisville, and that is made without hardship or annoyance.

For tickets and for further information, call at Pennsylvania ticket office, corner Washington and Illinois streets, or ticket office Union Station, or address

H. R. DERING,
Ass't Gen. Pass. Ag't Pennsylvania Lines,
Indianapolis, Indiana.

OUR 1889 CATALOGUE

Is in Printer's hands. Parties desirous of obtaining same will please forward their address at once to insure prompt mailing. Address,

Link-Belt Machinery Co.,
CHICAGO & MINNEAPOLIS,

—OR—

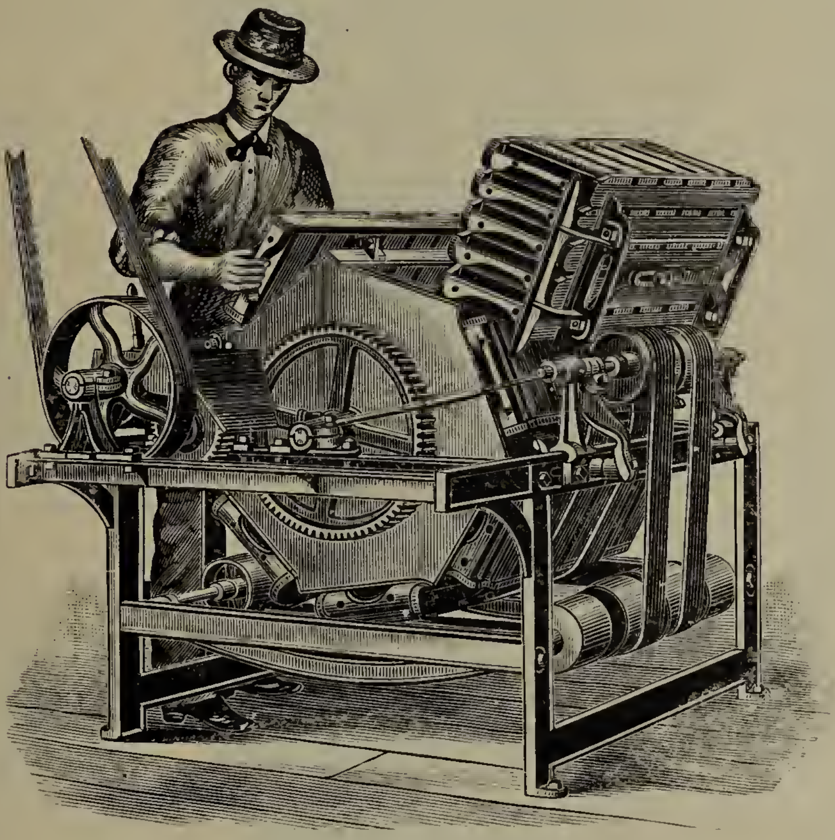
Link-Belt Engineering Co.,
NICETOWN, PHILADELPHIA, PA., &
49 DEY ST., NEW YORK, N. Y.

[Mention the Clay-Worker].

IMPORTANT—CHAMPION SANDER.

(See Ad. Outside Back Cover.)

A. H. Newton & Bros., manufacturers of the Champion Sander, have brought suit in the United States Circuit Court for the Eastern District of Pennsylvania, against a purchaser and user of the Potts Sander, as that machine they believe, from the advice of their Washington Patent Attorney and Counsel, is an infringement of their rights under their patents. They were the pioneers to produce a practical sander and have patented successfully numerous improvements brought out by experiment and experience, but have adhered to their basic principle of bands or belts as the means for automatically permitting the placing of moulds upon the cylinder for retaining the moulds in position while being sanded and for permitting the removal of the moulds after they are sanded. The bands or belts move with the moulds and cylinder so as to reduce the friction and wear. The feed attachment is also automatic, and a boy can attend the machine.



Champion Mould Sander.

The Champion Sander does not expose a leather or other band or apron to the direct action of the sand when holding the moulds in place on the cylinder to be sanded, and thus the bands do not become quickly worn out. Very recent improvements have been made which have fully overcome any defects in the machine. The trade is under obligations to any manufacturer that studies their needs, supplies their wants and furnishes machines fully up to the work for which they are intended.

The manufacturers of the Champion Sander have demonstrated their determination to supply only first-class sanders. They have spared no reasonable expense developing and perfecting their valuable invention, and now they have confidently submitted the question of their rights to the determination of a court of competent jurisdiction.

As they were the first to enter the field with an automatic sander they believe the Court will order all imitators to cease making, selling or using the most important elements of their invention poorly hidden by cheap and practically worthless and so-called "improvements." One certain manufacturer, who has been loud and boastful in charging that the temperate caution of the manufacturer of the Champion to the public was a mere "bluff," has now an opportunity to show good faith in the position which he assumes as an imitator by taking up the defense of one of his customers in court. This imitator puts the cart before the horse. Instead of adopting the practical and long-established method of driving a cylinder by connecting directly to its shaft he attempts an evasion and puts the labor on a broad expensive leather or rubber band, which passes but partly around the cylinder, and is constantly exposed to the destructive cutting action of the sand, and the natural and inevitable result can be seen by an expert to be, that the most expensive part of the machine is the first to quickly wear out It would seem to require replacement at great expense before a season of use has half expired.

BUY THE BEST.

Our Western trade has increased to such an extent to necessitate the establishment of a Western factory, Jonathan Craeger's Sons, Cincinnati, Ohio, are licensed manufacturers of the Champion Sander, and all orders intrusted to them will receive the same care and attention that has been given by the Eastern Factory which will be continued at Cohoes, New York. A. H. Newton & Bros.

THE CONTINENTAL HOTEL

Which will be the home of most of the delegates to the Brickmakers' Convention during their stay in Philadelphia, is one of the best known hotels in America. The selection of the Continental is a credit to the Hotel Committee for it is conveniently located, being but a short distance from the Convention Hall. It is situated in the center of the city convenient for shopping, theatres and general business.

Although within easy walking distance of the railroad stations, and omnibus meets all trains at the Broad Street Station and carries passengers to and from the hotel at the nominal charge of ten cents. Those who wish may take a Chestnut street car, which passes the door of the hotel.

The Continental contains over four hundred sleeping rooms, which are neat and cosy, while the spacious parlors, dining rooms and halls are unsurpassed.

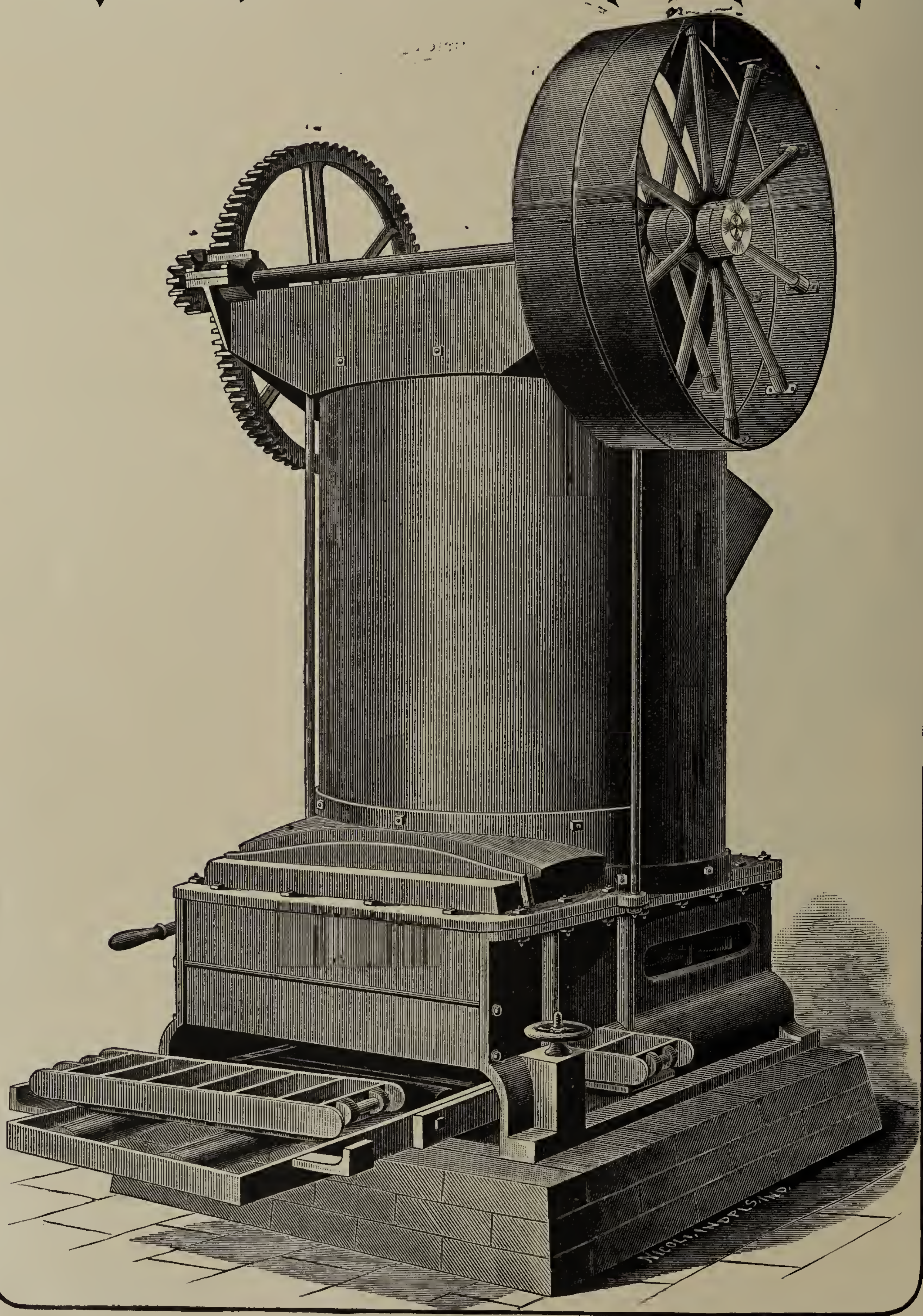
The service in the dining rooms and throughout the hotel is most excellent. Every modern convenience is provided, including fire escapes, and a supply of water from their own artesian well 240 feet deep.

Those who will be accompanied by ladies, especially, should notify the hotel of their coming, and order rooms reserved in order to obtain desirable locations. This will cost nothing but a two-cent stamp and the trouble of writing a letter, so do not neglect it. When registering at the Continental, inform the clerk that you are a delegate to the N. B. M. A., in order that there may be no misunderstanding.

Go to the Convention and stop at the Continental.

The Hoosier Brick Machine.

We manufacture a complete line of


NICOLI, INDPLS. IND.

Brick Tile and Clay-working Machinery.

—MANUFACTURED BY—

NOLAN, MADDEN & CO., Rushville, Ind.

Send for Circulars.

HUMAN NATURE IS WARY

And PLAIN, HONEST FACTS, carry more conviction than high flown extravagant claims from those having goods to sell.

Therefore we are modest enough to realize that what we would say about our machine would not be as acceptable to the trade as evidence from brick manufacturers who have used our machine.

Would those who have used them have any interest in misstating the facts to the detriment of other fellow brick manufacturers? You know they would not, and can accept their evidence, but should you be still skeptical, write us asking where the nearest machine to you is, then go and visit the yard and see for yourself, and then you don't have to depend on anyone's word.

There will be a machine not far from you as they are in nearly every State and Territory.

Our different machines are profitable for the smallest as well as the largest yards, we having three sizes of machines to which can be added auxiliary machines greatly increasing capacity and profit for the large yards. Some horse-power yards only want to make 1,500 per hour, while steam power yards run up to 45,000 to 50,000 per day, if wished.

We guarantee them to successfully work any clay that can be successfully worked by hand or any other machine. What more could you ask? Our prices are lower than all others except one or two whose machines as well as prices are TOO CHEAP. LOOK OUT FOR THAT CLASS.

Therefore we will present each month, statements from both large and small yards.

Read These and Watch For the Fresh Ones Next Month.

FROM STEAM-POWER YARDS.

LITTTE ROCK, ARK., Oct. 19th, 1889.

GENTLEMEN—In answer to yours of recent date, asking in regard to the "New Quaker" Brick Machine and Fletcher & Thomas Spiral Pug Mill that I purchased last spring, I feel it is due your firm to give you a complimentary letter, and will begin by saying that I only made 2,000,000 brick this season and did not run over three months in all. I made from 35 to 42 thousand good, nice, square brick per day of 10 hours, and I can cheerfully recommend it to all who want to get a good, serviceable, cheap machine, to buy the "New Quaker," and in regard to the Pug Mill, will just say that no mud working machine is complete without it. Wishing you the success you so richly deserve, I remain, Yours Very Respectfully, E. N. WEIGEL,
Supt. Pulaski Co. Prison.

MEMPHIS, TENN., Sept 25th, 1889.

DEAR SIRS—Will say in reply to your letter that the machine and Pug Mill have given us entire satisfaction in every respect. We are making 40,000 first class brick per day, and have made 42,000 first class brick in eight hours and twenty minutes. Will say further that this Company selected the slow-geared "New Quaker" as being the BEST Machine after looking at all the other first class machines, and are not disappointed in the selection. The "Quaker" outfit has cost us nothing for repairs this season, and after our season's work is in good condition. Yours, Etc.,
TENNESSEE BRICK & MANUFACTURING CO.,
Per J. H. Heusley, Supt.

SACREMENTO, CAL., Oct. 21st, 1889.

GENTLEMEN—We have been using four of your Heavy Steam power "New Quaker" Brick Machines for the past two years successfully in our Riverside brickyards, and intend ordering one more machine with the complement of Pug Mill and Sander, making our daily output 150 M per day during the summer months. Yours Resp.,
SACREMENTO TRANSPORTATION CO.,
By J. H. Roberts, Sec'y.

BELDING, MICH., Oct. 21st, 1889.

GENTS—The steampower machine we bought from you makes a good brick and all we can get away from it. Yours Respectfully,
PRALL & HUNTLEY.

FROM HORSE-POWER YARDS.

BENSON, MINN., Oct. 12th, 1889.

GENTLEMEM—We had a great deal of correspondence last winter with different parties concerning a brick machine, but after carefully considering them all, we finally decided that the "New Quaker" was the machine for us and we are glad to say that the machine has proven perfect in every respect. We had no trouble whatever in starting or operating the same, although we never saw one work before. We have not paid one cent for repairs, and to anyone wishing a machine, I would say—"Buy the "New Quaker" and you will have a machine that will give you satisfaction in every respect." Any information concerning your machine will be cheerfully given by addressing
Yours Truly. H. P. MCCONNELL & CO.

WINCHESTER, IND., Sept. 30th, 1889.

DEAR SIRS—The "New Quaker" Brick Machine is first class and does good work and can be run with less expense than any other machine making an equal number of brick. We are making 16,000 brick per day and have not spent one cent for repairs. The old machine was a good one, but the "New Quaker" is a dandy, and the new improvements in the last year make it the peer of any soft mud machine in the market. Its points are simplicity, strength, durability, adaptation to all kinds of clay and turning out a square, smooth and unexcelled brick. We want no better. Yours with Respect,
MARTIN & MARTIN.

CHESTER, NEB., Oct. 24th, 1889.

SIRS—At first we had trouble with our machine getting the brick out of the moulds in good shape, and I doubted it being a success in our material, it being very sticky and no sand near that we could mix with it, but after we had a little experience with bumping and dumping the brick on the pallets we made a smoother and better moulded brick than I have ever seen moulded by hand and as fast as three men can truck away. I am very well satisfied with your machine and would not mould by hand again. Respectfully,
J. L. NEVILLE.

BLOOMSBURG, PA., Oct. 5th, 1889.

DEAR SIRS—In regard to the "New Quaker" Brick Machine it has done very well for me. It makes a very nice brick at a less cost than they can be made by hand. When the clay is all right I can beat all brick made by hand moulders although I have five hand moulders at work, but if the season had been a good one I could have made more with the machine. It works like a charm and does not complain about tough clay. I will talk to you soon about a big steam machine, as I cannot supply the demand, and no more hand made brick for me.
Ever Yours, WM. FERGUSON.

☞ We are making a Brick Barrow that we think the best in the country. Also all other supplies.

Wellington Machine Co., Successors to Bennett Bros. & Co., Wellington, Lorain Co., O.

JOSEPH JEFFERSON.

"The Century Magazine" in 1890: Joseph Jefferson's Autobiography—Novels by Frank R. Stockton, Amelia E. Barr, and others—A Capital Programme.

During 1890 *The Century* Magazine (whose recent successes have included the famous "War Papers," the Lincoln History and George Kennan's series on "Siberia and the Exile System") will publish the long-looked-for Autobiography of Joseph Jefferson, whose "Rip van Winkle" has made his name a household word. No more interesting record of a life upon the stage could be laid before the public. Mr. Jefferson is the fourth in a generation of actors and, with his children and grand-children, there are six generations of actors among the Jeffersons. His story of the early days of the American stage, when as a boy, traveling in his father's company, they would settle down for a season in a Western town, playing in their own extemporized theater—the particulars of the creation of his famous "Rip van Winkle," how he acted "Ticket-of-Leave Man" before an audience of that class in Australia, etc.—all this, enriched with illustrations and portraits of contemporary actors and actresses, and with anecdotes, will form one of the most delightful serials *The Century* has ever printed.

Amelia E. Barr, Frank R. Stockton, Mark Twain, H. H. Boyesen, and many other well-known writers will furnish the fiction for the new volume, which is to be unusually strong, including several novels illustrated novellettes. and short stories. "The Women of the French Salons" are to be described in a brilliant series of illustrated papers. The important discoveries made with the great Lick Telescope at San Francisco (the largest in the world) and the latest explorations relating to prehistoric America (including the famous Serpent Mound, of Ohio) are to be chronicled in *The Century.*

Prof. George P. Fisher, of Yale University, is to write a series on "The Nature and Method of Revelation," which will attract every Bible student. Bishop Potter, of New York, will be one of several prominent writers who are to contribute a series of Present-day Papers" on living topics, and there will be art papers, timely articles, etc., etc., and the choicest pictures that the greatest artists and engravers can produce.

Every bookseller, postmaster and subscription agent takes subscriptions to *The Century* ($4.00 a year), or remittance may be made directly to the publishers, THE CENTURY Co., of New York. Begin new subscriptions with November (the first issue of the volume) and get Mark Twain's story, "A Connecticut Yankee in King Arthurs Court" in that number.

It Would Pay You To Use Hartman's Pallets.

HARTMAN'S IMPROVED PALLET
PRESSED UP WITH PATENT DIES

The above cut represents my Improved Convex Brick Pallet, which is and must be superior to any other. It is concaved in center of sheet—the rise is, from leg to center of pallet, ⅜ of an inch, it strengthens the pallet, also makes a better appearance, and as the pallet is pressed up with patent dies on an 82-ton press it makes the pallet stiff, no springing. Also the edges on side of pallet are much stiffer and are not liable to crack all along the edge as when bent down by a break, which takes the life out of the pallet. These pallets are pressed up out of best refined and bloom flange iron, also annealed steel.

They are delivered to any one using them free on board in Philadelphia.

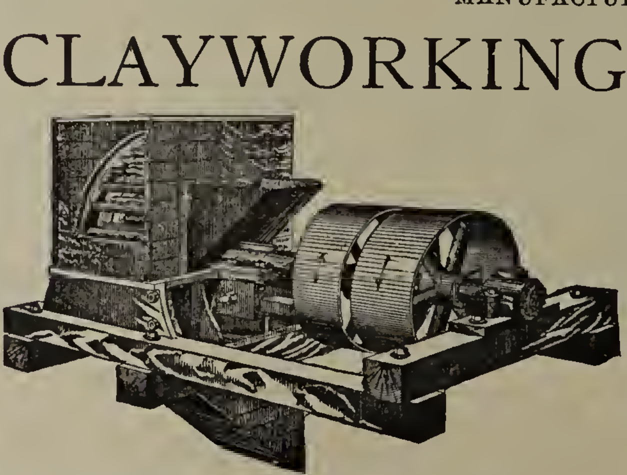
Regular Size Pallet: 34 in. by 12 in., 1 in. turned down, legs ⅛ by 1 in. and best strap iron with 3 rivet on top and 2 on side. Or any size made to order.

Plain, in bloom iron, Japanned, Galvanized, Leaded.

80 Thousand in Use. 80 Thousand in Use.

GEORGE W. HARTMAN,
Tenth and Norris Street, PHILADELPHIA, PA.
Steam, Hot Air and Ventilating Works.

EAGLE MACHINE WORKS MFG. CO.,
MANUFACTURERS OF
CLAYWORKING MACHINERY.



Patent Pending Cyclone Pulverizer.

The Lone Star Brick Machines, Eagle Pug Mills, Hercules Clay Rolls and Re-press Machines, Steel Moulds, Tile Mills, Etc. Pug Mills, Elevators and Engines.

940 and 942 N. Main St. (Mention Clay-Worker.) ST. LOUIS, MO.

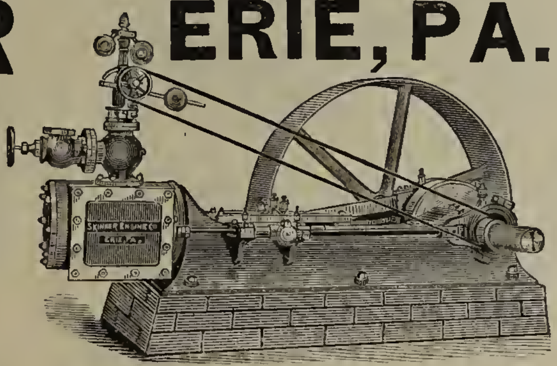
We do STAMPING and PRESSING of sheet metals for all classes of work. Also TINNING, GALVANIZING and JAPANNING.

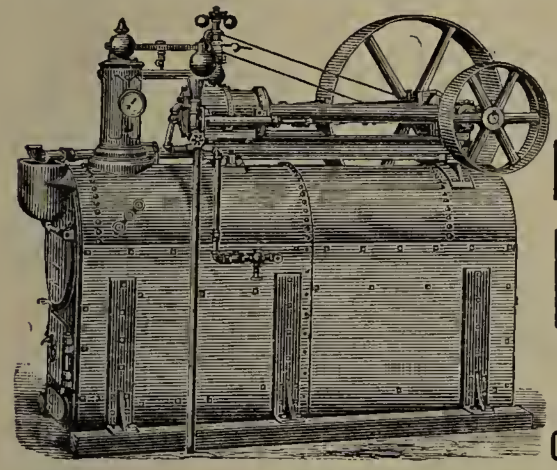
New York Office, 51 Cliff Street, HALL & NEAR, AGENTS.

SKINNER ENGINE CO.

ERIE, PA.

OVER 3400 IN USE





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PORTABLE AND STATIONARY

Engines AND Boilers

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P. L. SWORD & SON.
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THE
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BRICK MACHINE
SWORD'S IMPROVED BRICK MACHINE P. L. SWORD & SON SOLE MANUFACTURERS CLEVELAND OHIO U.S.A.

To Brick and Tile Burners

CRUDE OIL AS FUEL FOR THE FIRING OF KILNS OF ALL KINDS WITH THE MITCHELL COMPRESSED-AIR OIL BURNER.

Within the past year we have applied our Air Burner to Brick Kilns for the burning of brick with crude oil as a fuel, and the results have been so very satisfactory that we are warranted in now offering our burner as the most successful one for this purpose, as well as for most others.

We are now prepared to fit out kilns of any size, and can assure customers that they will be satisfied with the apparatus. The advantages of our burner over all others are many and result from the use of compressed air for the operation of the burner in place of steam, which is used in all other burners.

The advantages may be stated as follows:

1st. Our fire is always under complete control.

2nd. Our burner remains lighted with a small fire, in a cold, damp arch. No steam burner, that we know of, will produce a sufficiently small and gentle fire for he early stages of brick burning.

3d. We require no specially constructed furnace or kiln. We can apply the burner directly to the arches without furnaces, or to any style of furnace.

4th. The drying off process is much more quickly and cheaply accomplished with our burner because we avoid blowing out steam into the bricks; we use only air.

5th. We make a saving of from two to three days in the time required to burn a kiln.

6th. It only requires one man to each shift to attend to the entire kiln.

7th. Our burner does not crack or melt the arches and yet it burns the kiln hard to the top course.

8th. The fire set at any desired strength in an arch will remain at that strength until altered by the operator.

It is useless to attempt to state the time required to burn a kiln, or the amount of oil needed, because clay differs greatly in different localities; bricks are set to different heights, and bricks are burned to different degrees of hardness and the amount of fuel required varies accordingly.

To burn the whole kiln into good, hard bricks with average clay will require about one barrel or 40 gallons of crude oil per thousand brick; or 40 gallons of oil about equal 10 bushels of good Pittsburgh coal.

Upon investigation, you will find that this is better than is done by any other burner, and for the advantages as mentioned above, you will find our burner to be in every way superior to all steam burners.

We have fitted up the Cincinnati Brick Co. yards near Addyston, Hamilton Co., Ohio, on the C. I. St. L. & C. Railway, (Postoffice address, Johnston Building, Cincinnati, Ohio) and that Company has burned about two and one-half million brick with our apparatus. Anyone will be welcome at their yard to see the burner in operation, and the foreman, Mr. A. C. Spahr, or the Company will give all the information desired. In the case of this Company, we run not only the kilns, but the boilers and all the machinery on the place. For terms and information, address

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FOR SALE, WANTED, ETC.

☞Advertising rates in this column 20 cents a line, or 3 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion.☜

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M. F. WILLIAMS & Co.,
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FOR SALE. One Eureka Brick Machine and Clay Crusher at a bargain. Both in good running order.
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FOR SALE. One steampower sewer pipe press with dies from 3 to 24-in. Also cluster dies for tile from 3 to 7-in.
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FOR SALE. One Chambers Brick Machine with engine and boiler complete. For particulars, apply to
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FOR SALE. Bennett Brick and Tile Machine, nearly new. Four complete tempering wheels for steam power.
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$3,000 worth of brick and tile machinery. Will be sold at a sacrifice of $1,000. For description, etc., address
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WANTED. A good, practical traveling salesman, thoroughly conversant with clay-working machinery. Address THE SOUTHERN EQUIPMENT CO,
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FOR SALE. Elevator; extra strong chain 82 feet long, at half price. Also 26 kiln doors and frames and bands, cost $5.00 each. Will sell for $2.50 each. Address, or call on
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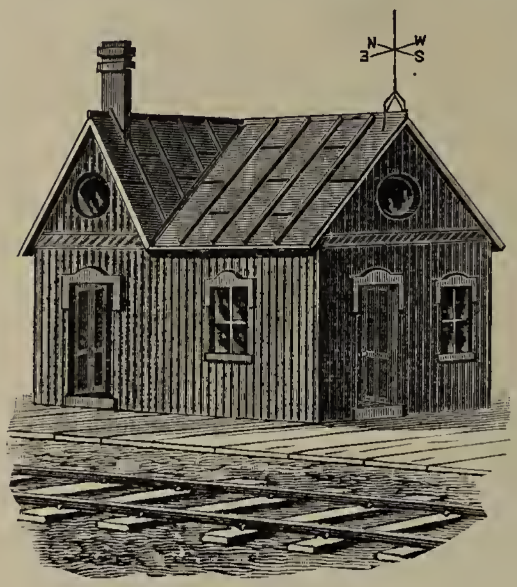

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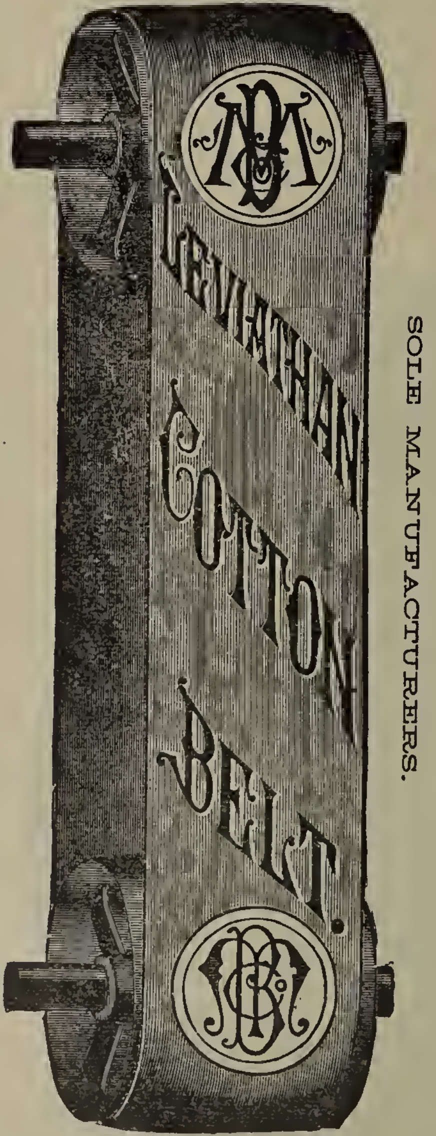

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For Fire Clay, Red Brick Clay, Limestone and Lime, Sand and Other Refractory Materials.

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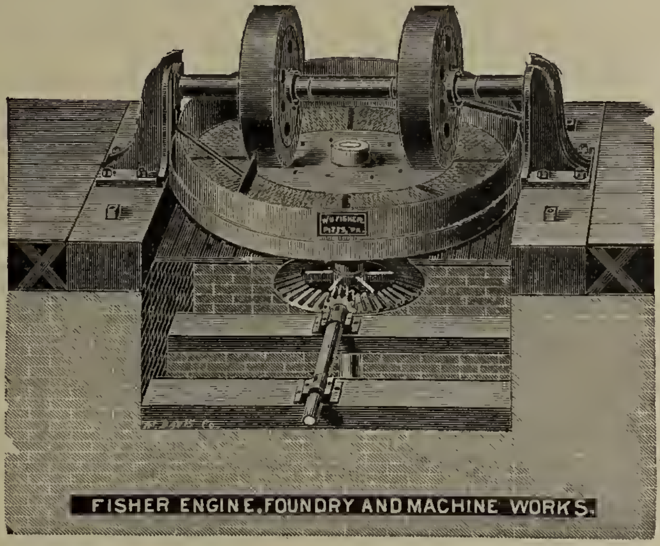
This Pan is undergeared and will grind Fire or Red Clay for 20,000 brick in 10 hours.

The Rolls weigh 5,000 lbs. each.

We make this Pan in different sizes, from 5 feet to 9 feet in diameter.

We also make them with iron frames or wood frames for overhead gear.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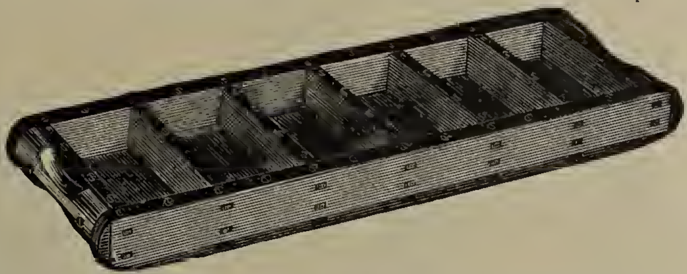

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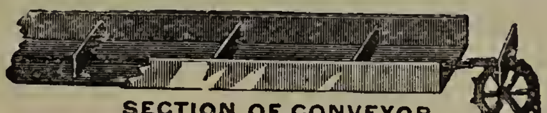

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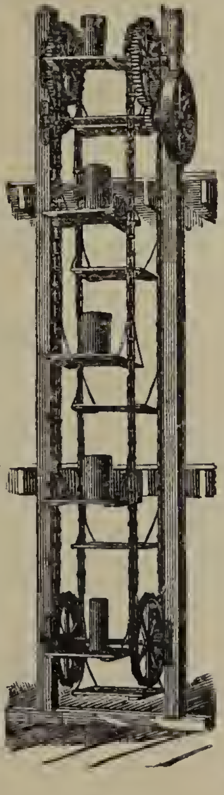

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FOR SALE. One "Titley Screw Press" for repressing brick. Dies for making square, octagon, 4¼" round and 1½" round brick. An entirely new press. After purchasing it other arrangements were made obviating the use of this press, so it will now be sold at a bargain. K. C. HYDRAULIC PRESS BRICK CO.,
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BRICKYARD IN FLORIDA. I will lease or rent on royalty, or for a share of the brick, my brick yard here at *Bluff Springs*. There is an abundance of clay, wood, water and other facilities necessary to make brick in any quantity or of any kind. I will rent the yard to a good man and charge him nothing for instructions in *setting and burning*. Healthiest place in the world. Good schools, churches, etc. Write for particulars. J. W. CRARY, SR.,
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FOR SALE, at Tampa, Fla. Brick factory, 40 acres of land, only clay found within 40 miles; 16 h.p. engine, 100 M shed room, Chief Brick Machine, capacity 20 M. Pallets, sheds, cars, barrows and tools, River transportation. Tampa is the coming town of Florida. Cause of selling, other business.
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SUPERINTENDENTS WANTED for dry pressed brick works. We are planning and fitting up at the present time about twenty brick plants with the Boyd Semi-dry Brick Press. Several of these are new yards. We will want foremen or superintendents. Parties desiring such positions will kindly write us fully, giving us references, experience they have had, etc., etc. Correspondence confidential if desired.
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FOR SALE. 2 Adrian Brick and Tile Machine Cos brick machines, 2 Frey, Sheckler Cos' Cut-off Tables, cut 13 brick at a time. These machines have been in use only 3 months and are all good as new. I have four outfits like this and am going to run only two of them on account of dry room. A lot of 3-in. shafting, several large pulleys, belting; large first-class engine, 75 h.p., large boiler, two steampower hoisting drums for hoisting clay to machinery. All are new and in first-class condition. Will give a bargain if sold soon. We make pressed brick on these machines that we get $18 per M for. Address F. G. LOTTERER,
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Beginning with Wednesday, October 16th, the Pennsylvania Special, train No. 20, leaving St. Louis at 8:10 a.m., will carry a Pullman Dining Car from St. Louis to Columbus. Breakfast will be ready at 7:30 a.m., and be served until 9 o'clock inclusive. Dinner will be served between 12:30 p.m. and 2:30 p.m. Supper between 6 p.m. and 8 p.m.

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It is a conceded fact that perfect drafts and perfect combustion are indispensable to a perfect kiln. *Such* is the "New Discovery." This kiln is adapted for burning almost anything made from clay; can be constructed for either wood or coal and burn evenly throughout; is easily managed—will save in fuel, time of burning, wages of the burner, use of the kiln—nearly one-half.

The proprietors of this invention propose to sell kiln yard or territorial rights reasonably and guarantee it to be the best kiln the purchaser ever saw or used.

Everybody is cordially invited to visit our works, where a kiln is, almost, in constant operation. We also have an arched iron door frame which is indispensable to a perfect kiln.

Send for circulars and testimonials.

We shall protect our patents from infringements.

Reliable resident agents wanted. Address—

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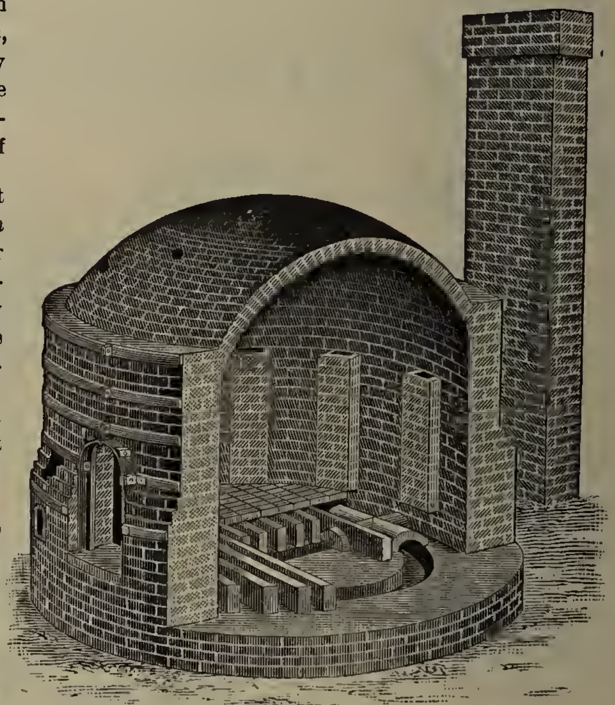

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A large capacity and easy working pump for **Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries,** or wherever it is desired to raise a *large quantity* of water by *Hand-power.* The pump has large valves (*accessible by hand*) and will pump water containing *sand, gravel, mud, sewage matter, etc.,* without *choking* or any *perceptible wear.*

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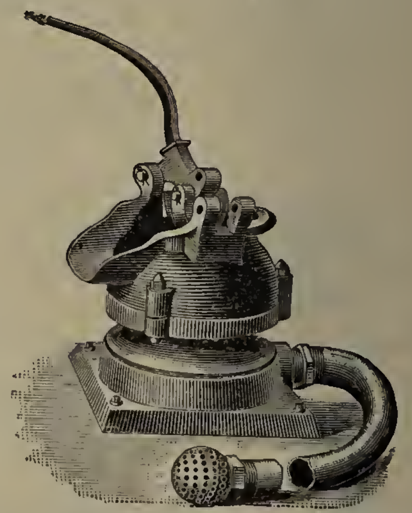

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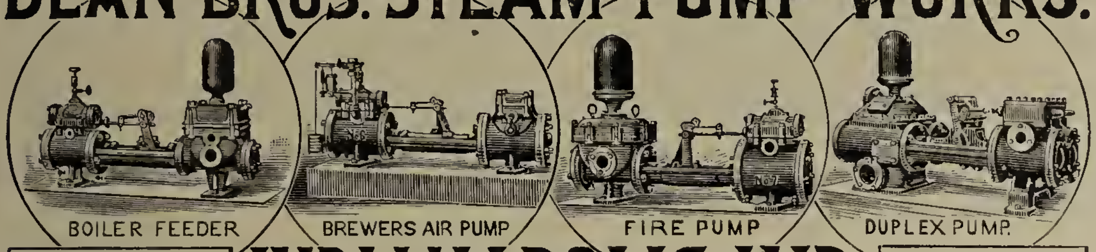

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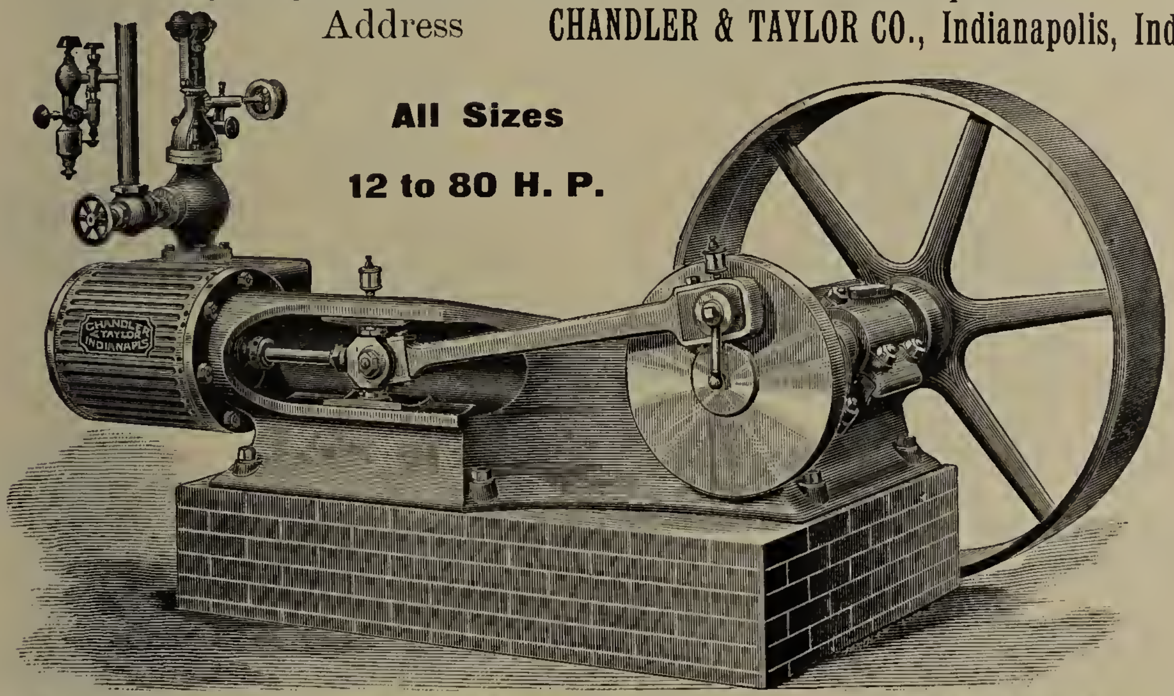
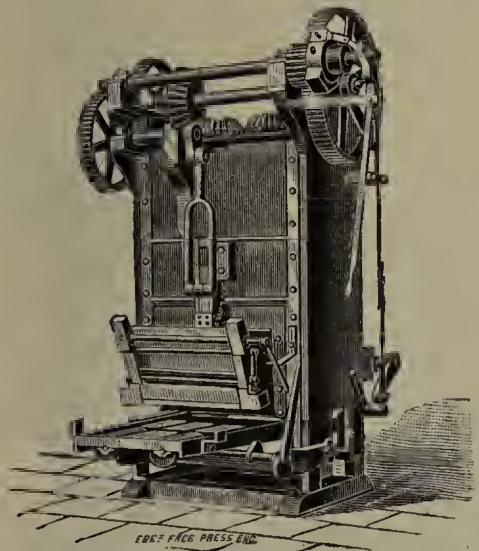


THE DUPLEX BRICK MACHINE.



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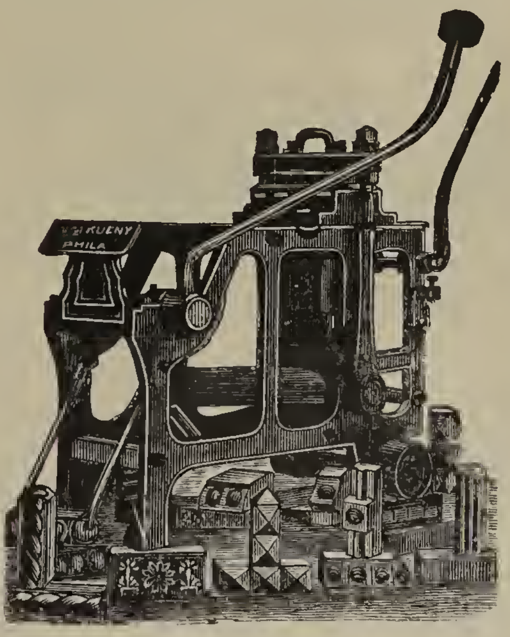

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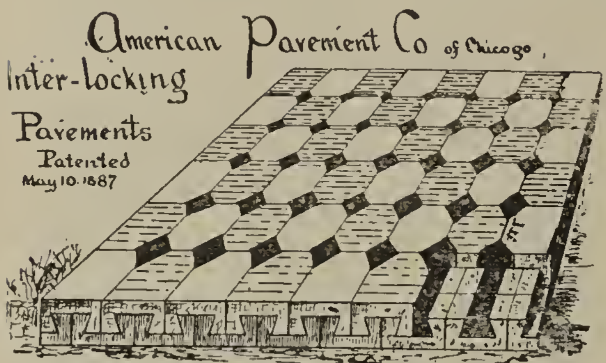

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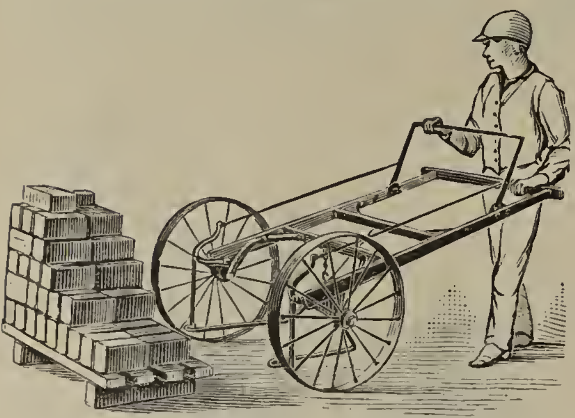
STEELE'S IMPROVED Brick Truck —AND— Portable Hack.



The principle of handling and drying bricks by the Portable Hack System has been perfected in this Truck and VENTILATED HACK BOARD, being the most practical Truck and method ever yet introduced, saving labor in handling and time in drying bricks. Can be used in any yard not too steep. Is especially adapted for medium dry clay machines.

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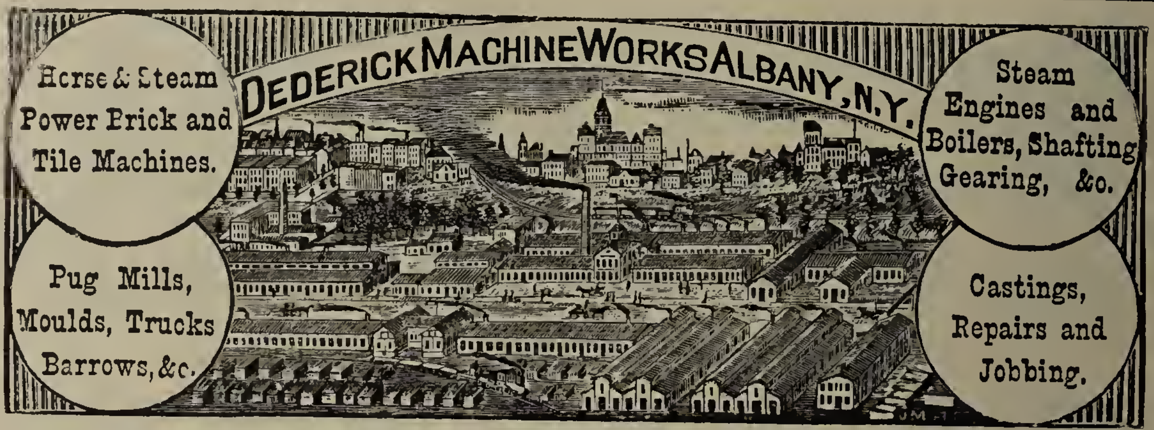
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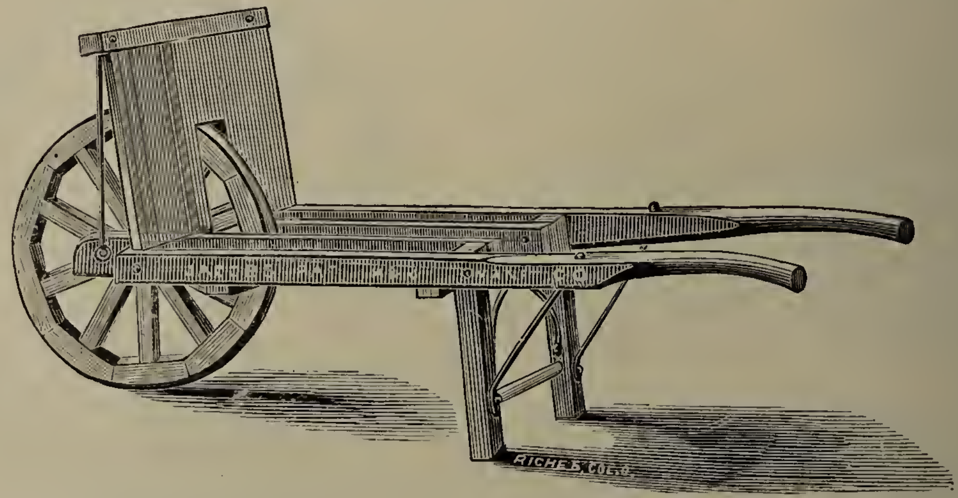

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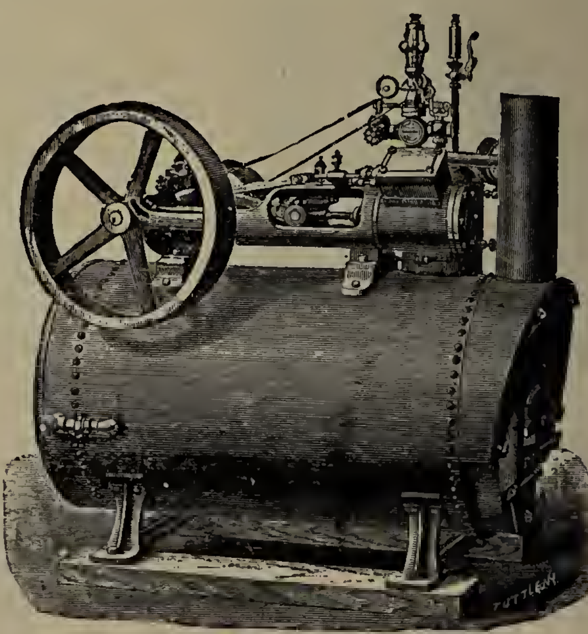

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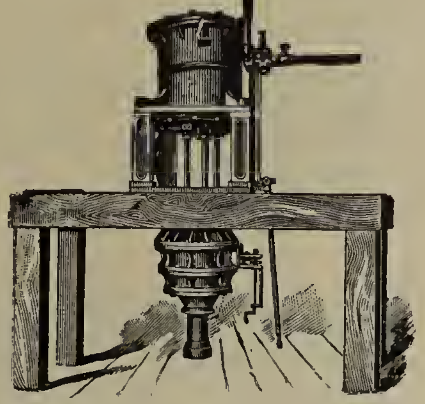

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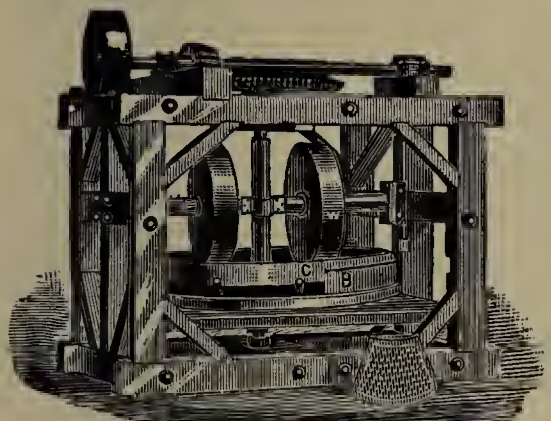

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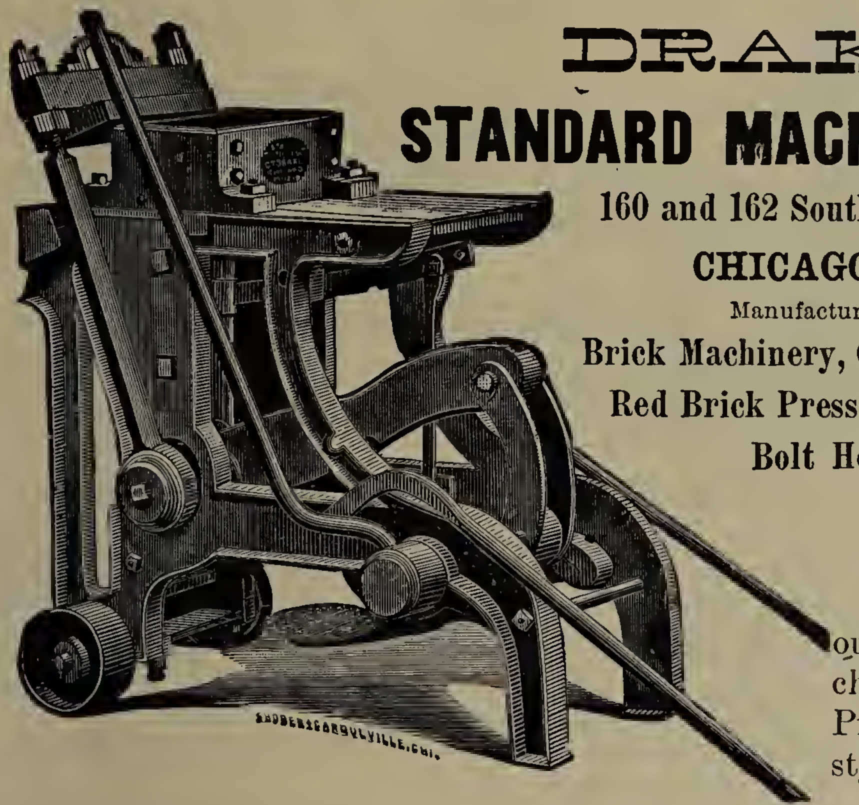

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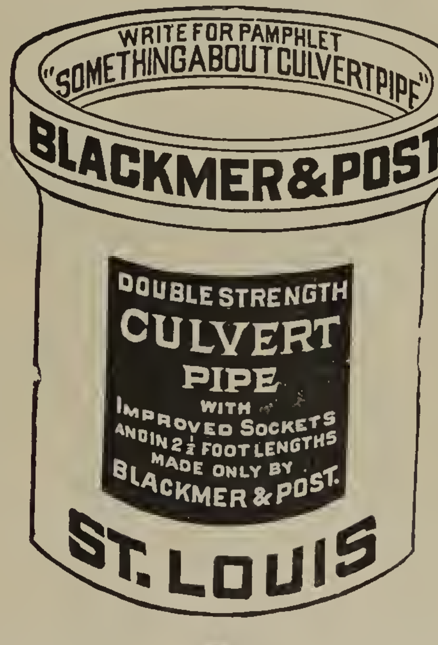

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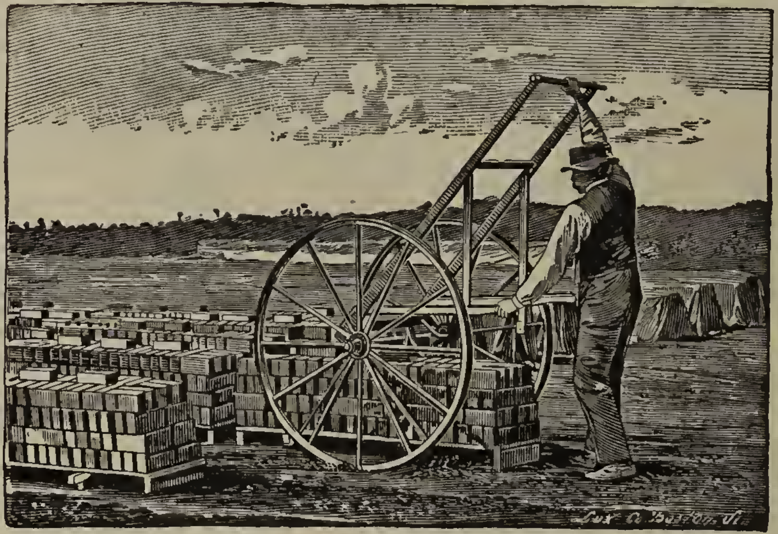

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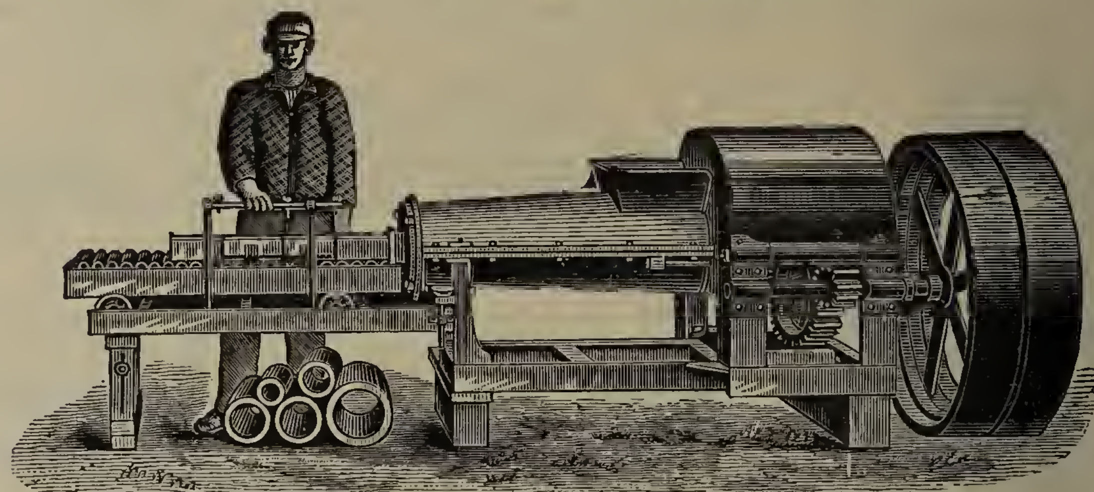

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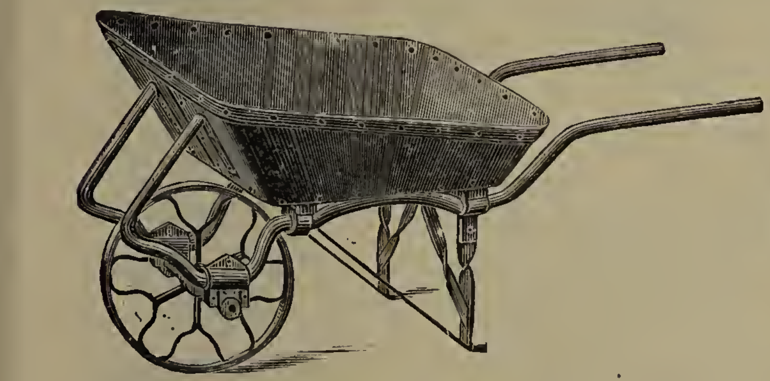

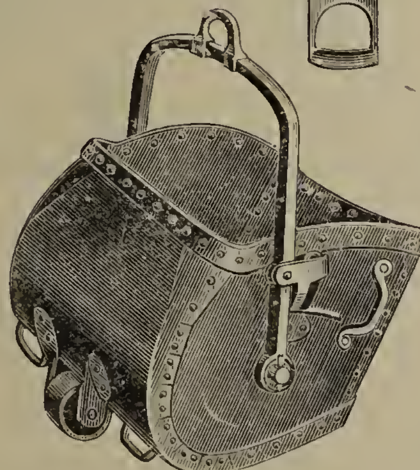

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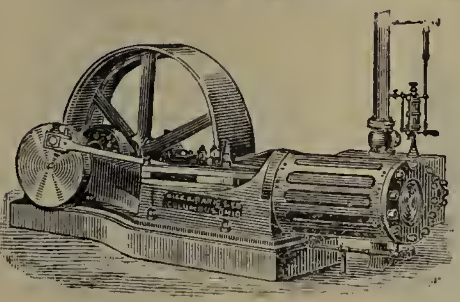

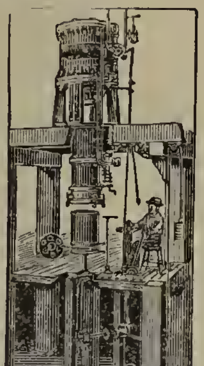

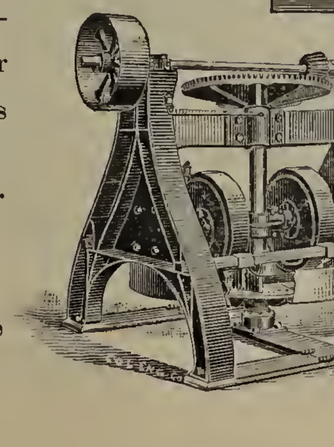

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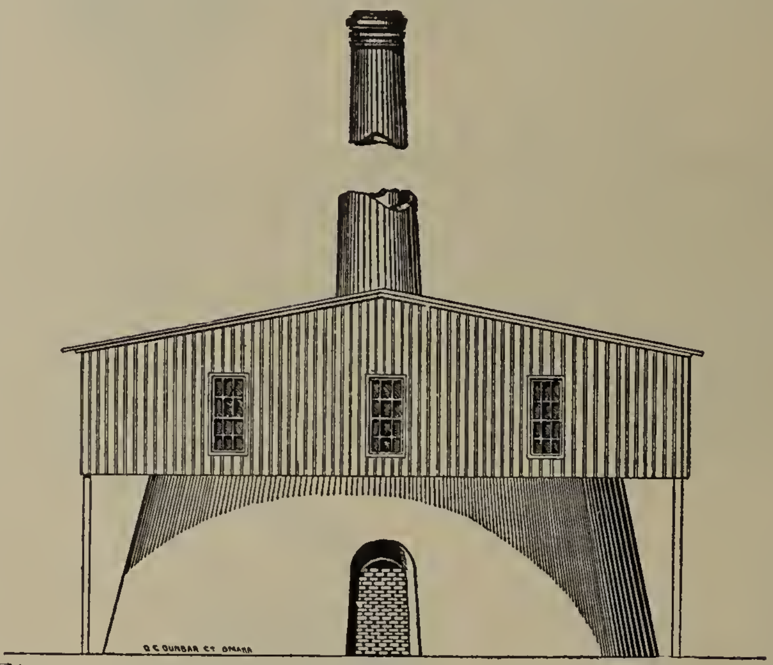

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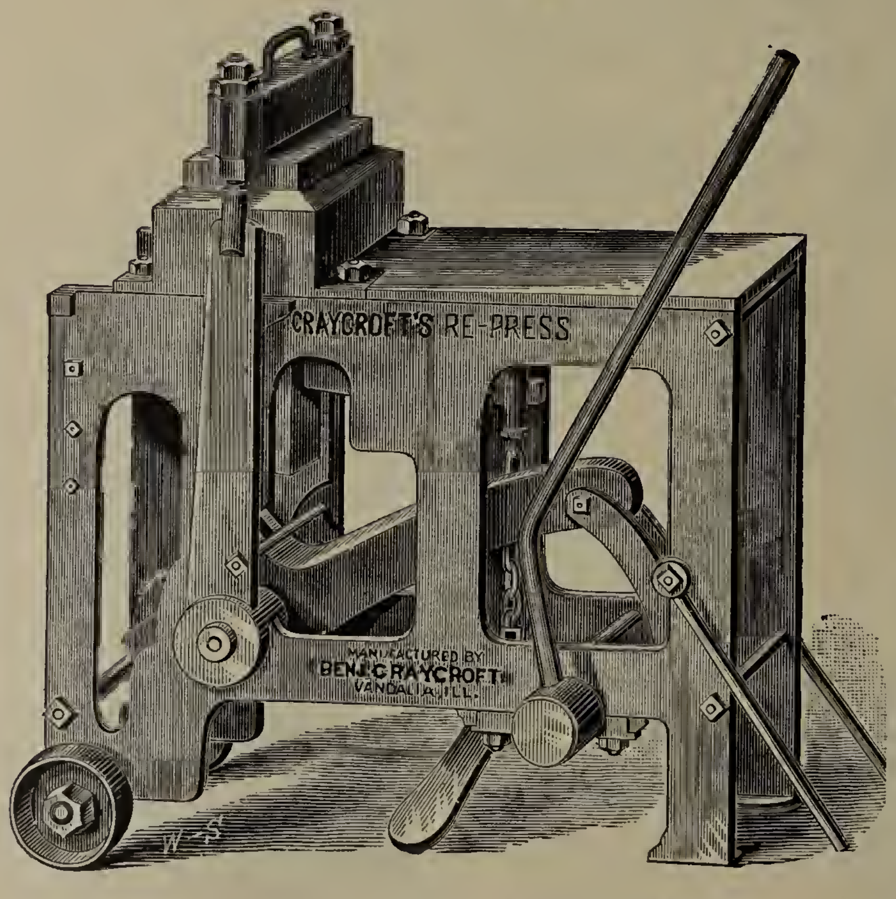

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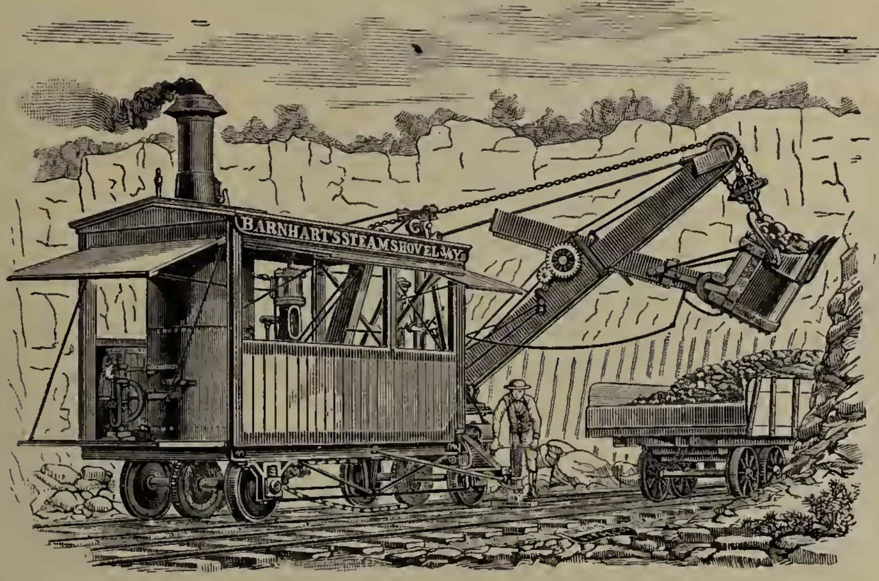

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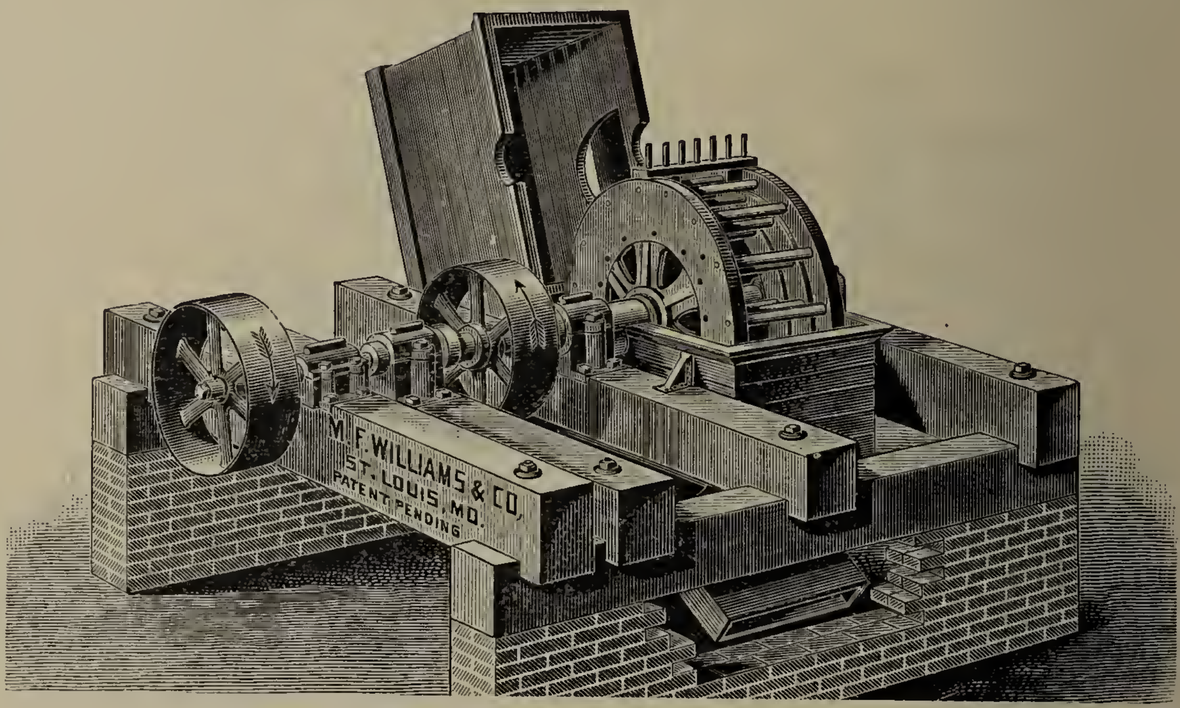
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DUNKIRK ENGINEERING COMPANY, Dunkirk, N. Y.
SEND FOR CATALOGUES.

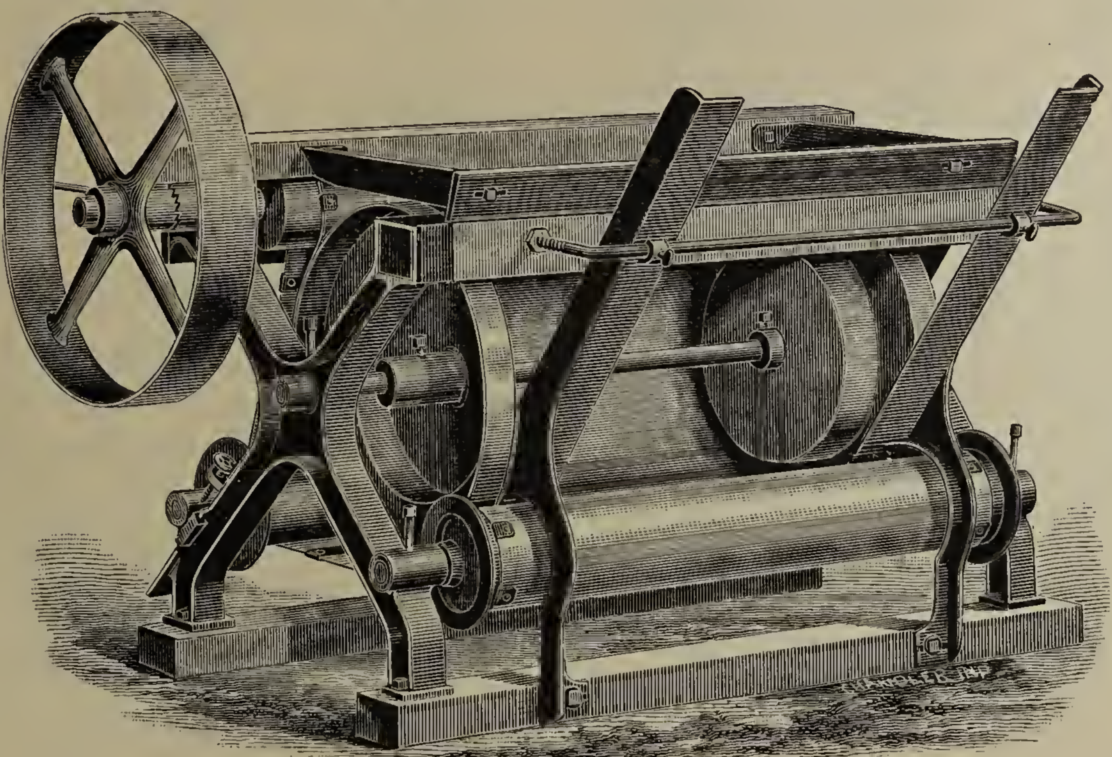
The Potts' Improved Mould Sander

Has been thoroughly tested and has proven to be a superior machine to any made. It is working **successfully** where other machines have failed to give satisfaction. It is **acknowledged** by all **Brickmakers** to be the simplest and most durable machine on the market.

C. & A. Potts & Co.;

GENTS:—As to your Mould Sander, we can only say that we could not ask for a machine that is nearer perfection both as regards simplicity and efficiency. It does not and cannot leak. The moulds do not and cannot clog or catch, and we are satisfied with it in every way. You are at liberty to use this in any way you may see fit and we shall be pleased to answer any inquiries, or show the machine at any time to any one you may send here.

We are yours truly,
BERLIN BRICK CO.



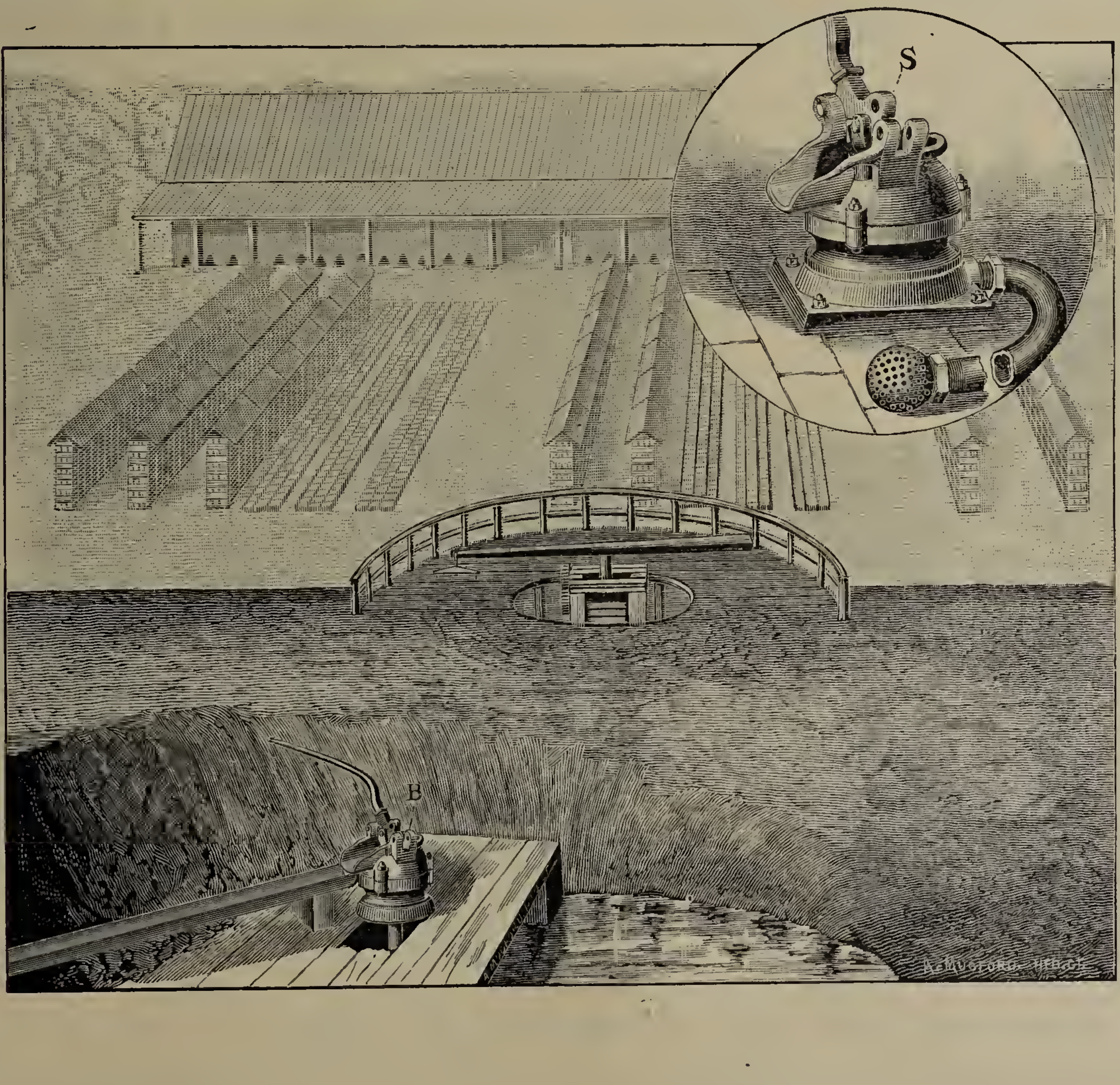
W. H. Carter, Brick Mannfacturer.
Appleton, Wis., May 25th, 1889.

C. & A. Potts & Co.:

GENTS:—I have set your Sander and given it a fair trial. It is just what I want and is just what yon claim for it, and has given perfect satisfaction. Yours truly,
W. H. CARTER.

It does not spill or waste the sand. The sand cannot spill through the vents in the moulds. There is no place for the moulds to catch and cause delays. There are no springs or light complicated parts to get out of order. All machines guaranteed to do as claimed or no sale. Write for prices and terms,

C. & A. POTTS & CO., Indianapolis, Ind.



A large capacity Pump for Brickyard use.

Will pump water containing sand, gravel, mud, etc., without perceptible wear.

Capacity, 3,500 to 4,000 gallons of water per hour by hand power.

These pumps will be sent on 30 day's trial to responsible brick makers.

Every brickyard should have one of the large capacity hand pumps for emergency.

Price of pump for Side Suction Connections marked in cut S, $26.00.

Price of pump for Bottom Suction Connections marked in cut B, $24.00.

A discount of 15 per cent. will be made from the above prices for the next 60 days.

These pumps are constructed under the supervision of the Inventor,

Geo. D. Loud,
BOSTON, MASS.
Room 78 Mason Bld'g.

THE STANDARD BRICK MACHINES

—MANUFACTURED BY—

A. M. & W. H. WILES,

Grassy Point, Rockland County, New York.

These Moulding Machines have been in constant use for over 30 years, and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

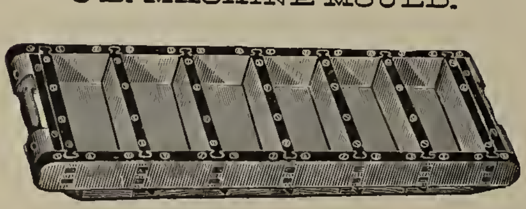
We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

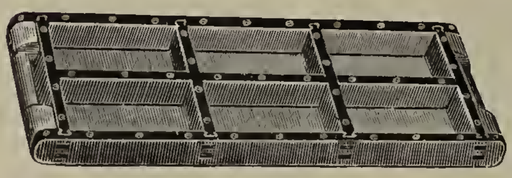
CORRESPONDENCE SOLICITED.

---

6 B. MACHINE MOULD.



6 B. HAND MOULD.



3 B. HAND MOULD.

D. J. C. ARNOLD,

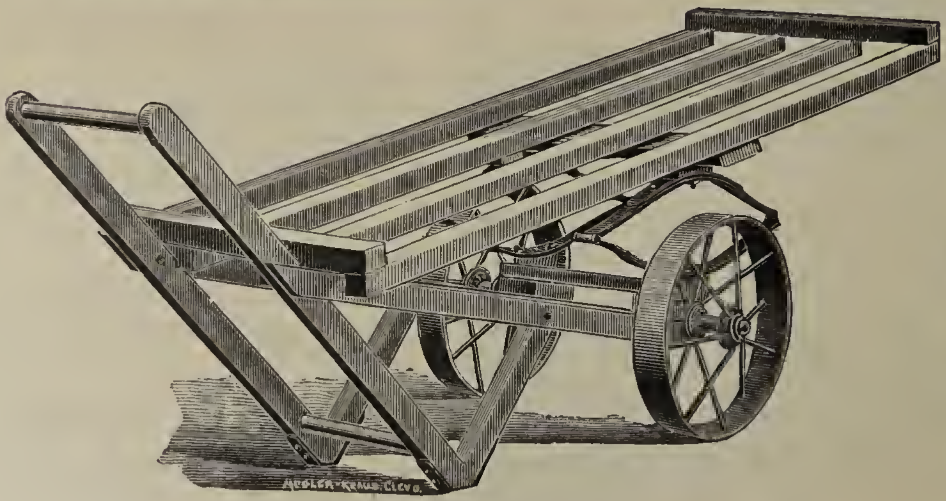
MAKES ∵ BRICK ∵ YARD ∵ SUPPLIES

At NEW LONDON, OHIO.

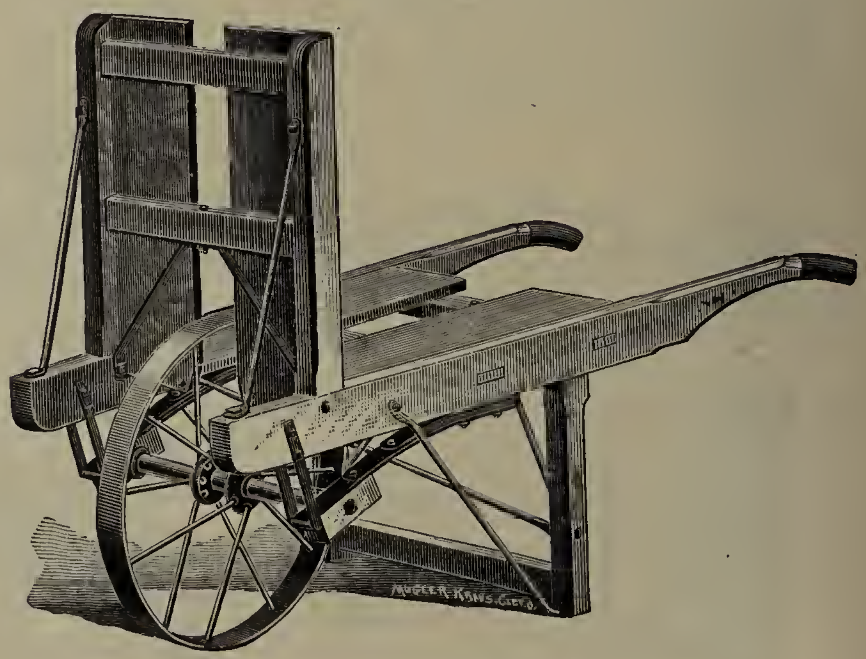
Get his prices before you buy. All goods first-class in every respect.

[Mention the Clay-Worker.]

☞Catalogue sent on application.



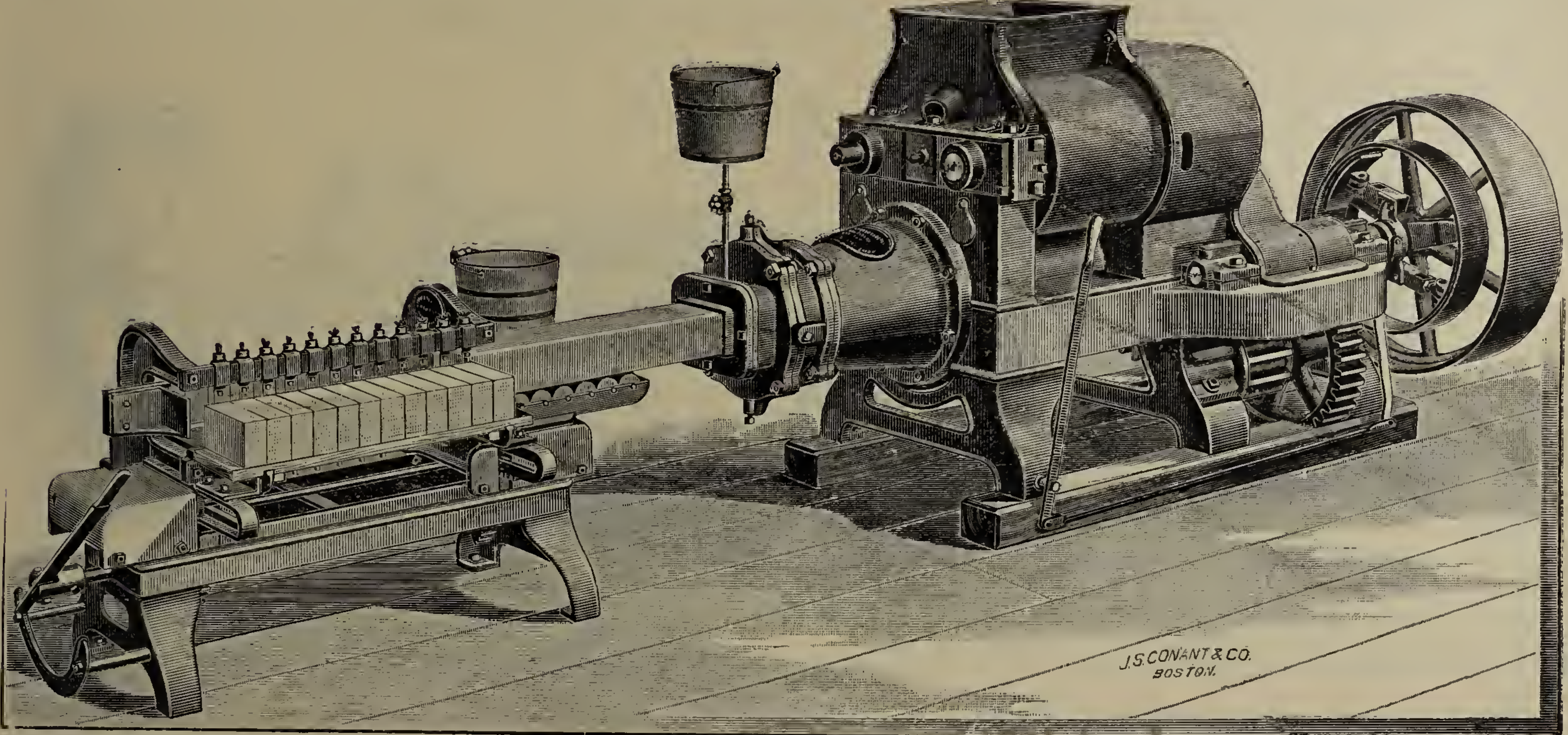
NO. 10 SPRING TRUCK.
(Weight 100 pounds.)



NO. 1 BRICK BARROW.
(Weight with springs 100 lbs.)

THE OHIO BRICK AND TILE MACHINES.

THREE SIZES. .CAPACITY 10,000 TO 40,000 BRICK PER DAY.



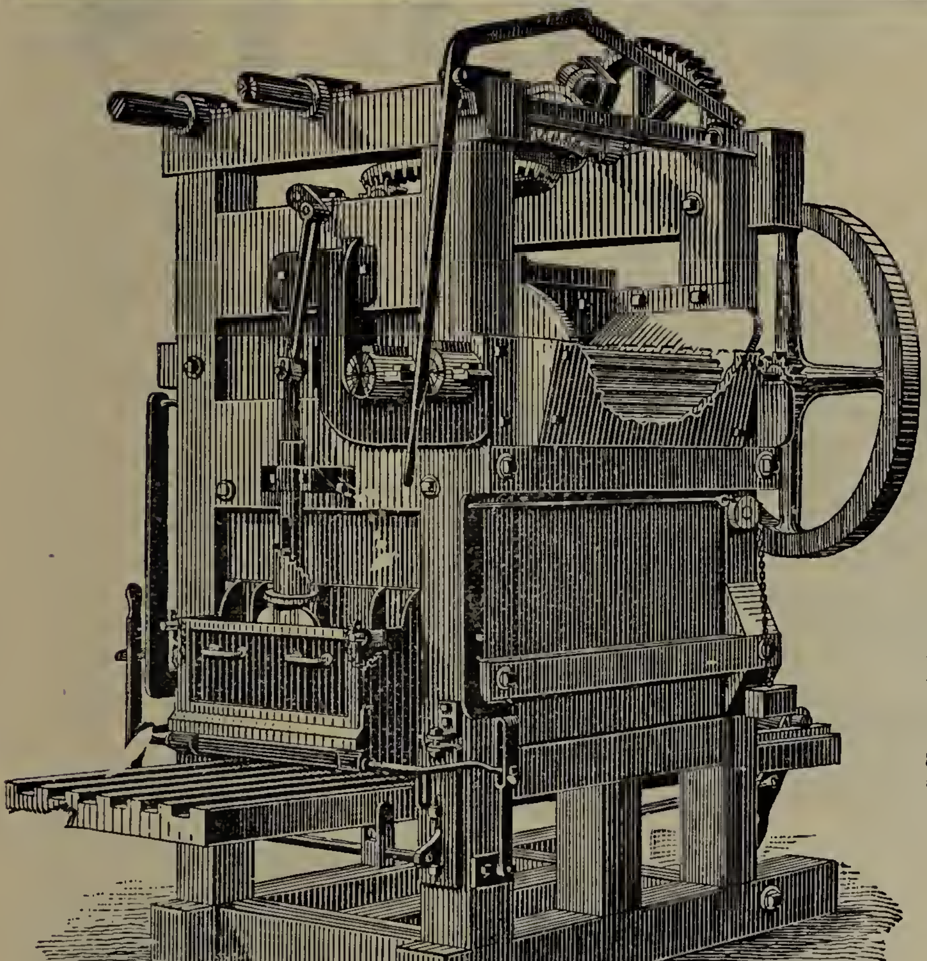
"A" or Largest Size Machine with New Board Delivery Cutting Table.

Unequalled for the manufacture of Building, Paving and Fire Brick, Hollow Blocks, Drain Tile, etc. Satisfaction guaranteed.
☞ For Catalogue and particulars, address

FATE & FREESE,

Mention this paper.

PLYMOUTH, Richland County, OHIO.



GURNEY
BRICK MACHINE WORKS,

MILWAUKEE, WISCONSIN,
Manufacturers of
THE GURNEY BRICK MACHINE
—Having Crushers Inside of Pug Mill.—

THIS is the only Machine in use which has the *combination of Crushers, Mixing and Moulding Apparatus* in a single machine. The arrangement is covered by patent issued October 6, 1885.

This machine will work any clay, however hard and lumpy, with no preparation before soaking in the usual way.

The Crushers will take the clay through as fast as the machine will turn out the brick, *doing entirely away with lumps*, which brickmakers know have been much in the way of making good brick, and also have caused great loss by breakage.

The Machine will turn out four thousand, or more, good, smooth, square brick an hour. With proper moulding sand THE BRICK FROM THIS MACHINE, *made from any clay*, WILL SLIP EASILY. The Machine has been thoroughly tried in different parts of the country.

Also First-Class STEAM and HORSE-POWER MACHINES of same pattern, without Crushers.

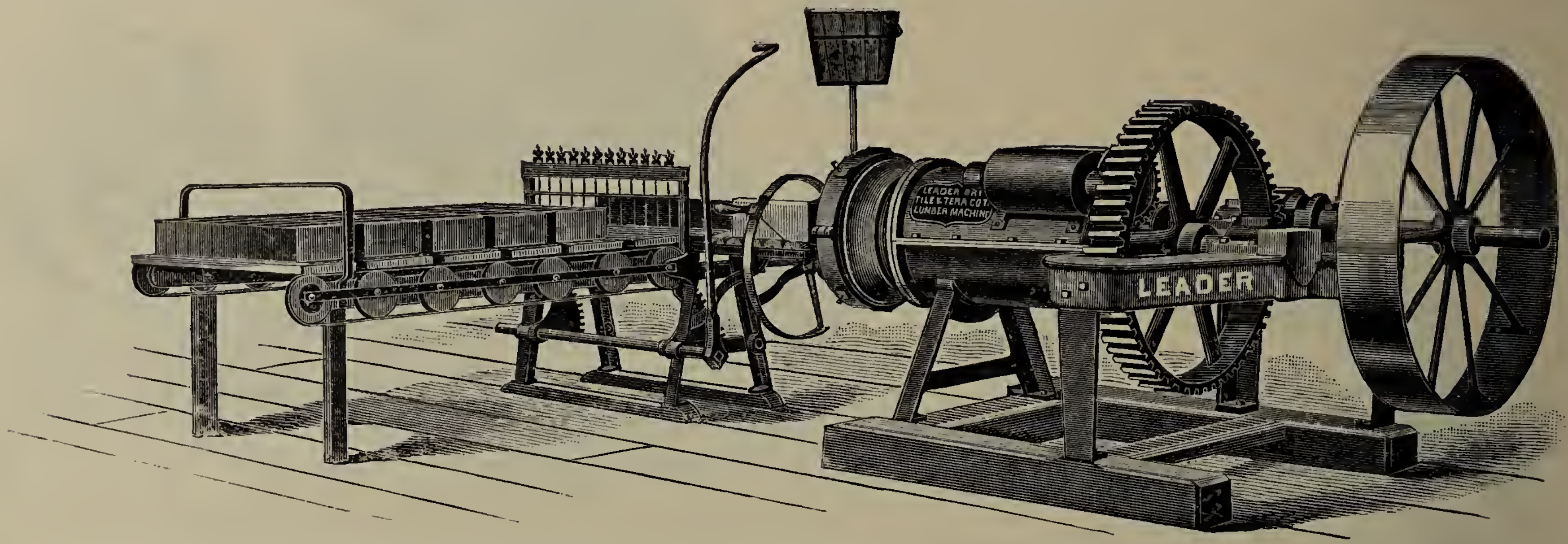
For further information and Illustrated Catalogue address—

T. C. GURNEY,

100 Wisconsin St., MILWAUKEE, WIS.

THE ✣ LEADER ✣ BRICK ✣ MACHINE.

With Self Delivery Table and Lubricating Die.



We manufacture the latest and most approved designs of machinery for making Brick and Tile. Also a complete line of Clay-working Machinery, Clay Crushers, Elevators, Dump Cars, etc.

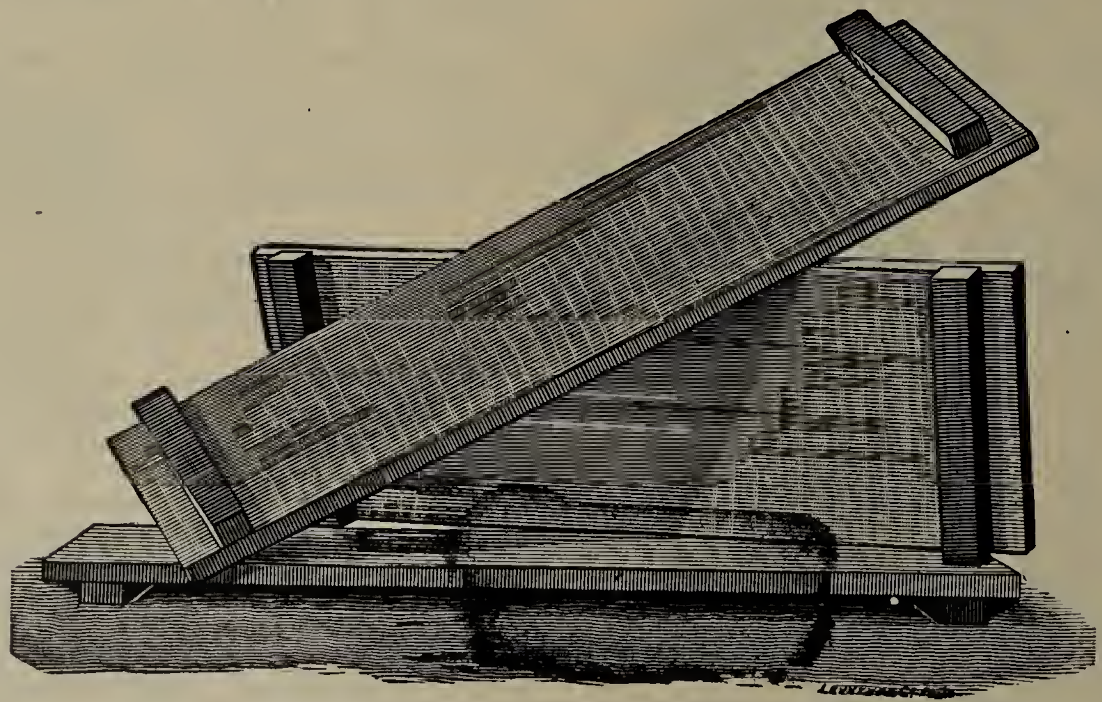
Circulars free. Correspondence solicited.

BROWN & HARROP MFG. CO.,

Mention Clay-Worker.] PORTLAND, IND.

BRICK PALLETS.

Brick Pallets.



Brick Pallets.

PIPE BOARDS, ROOFING LUMBER Supplied Direct in Carload Lots.

When writing for prices, give an exact description of the kind of pallet wanted, as different pallets are in use in different sections of the country. State whether cleats are to be nailed on; also length, width and thickness of the pallet. We have a big trade in this line and can save you one profit. Write for prices.

W. B. MERSHON & CO.,

Manufacturers of all kinds of white pine lumber and packing boxes in shooks.

East Saginaw, Mich.

ATTENTION, TILE-MAKERS.

Such improvements have lately been made in the production of Porous Earthenwares that the power and facilities usually afforded by the common drain tile manufactory will enable a manufacturer to step into a new and profitable business, protected from competition, at an outlay not exceeding that already invested in his plant, by more than One Thousand Dollars.

Shop rights or Territorial rights upon a royalty basis supplied by

The International Terra-Cotta Lumber Co.,

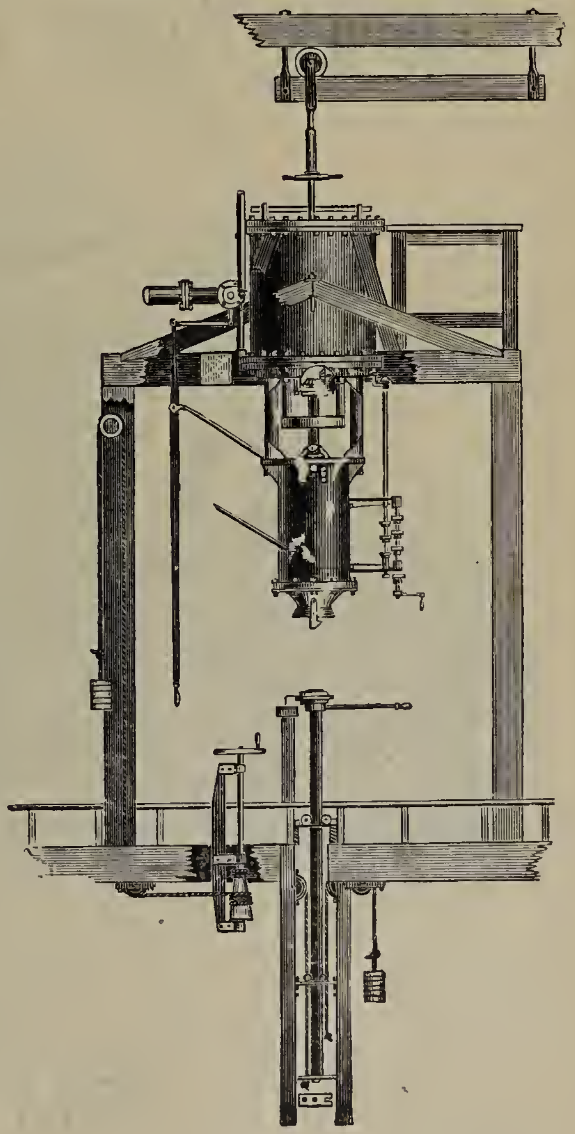
115 DEARBORN STREET, CHICAGO, ILLS.,

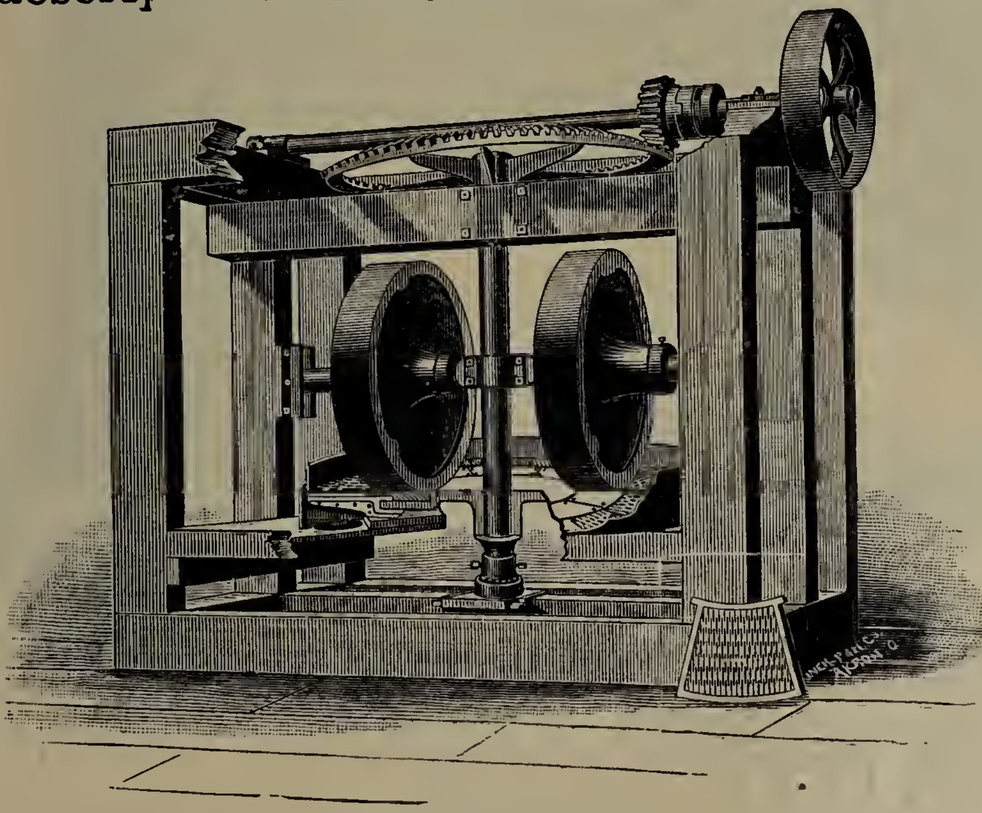
to whom all applications and correspondence should be addressed.

TAPLIN, RICE & CO.,

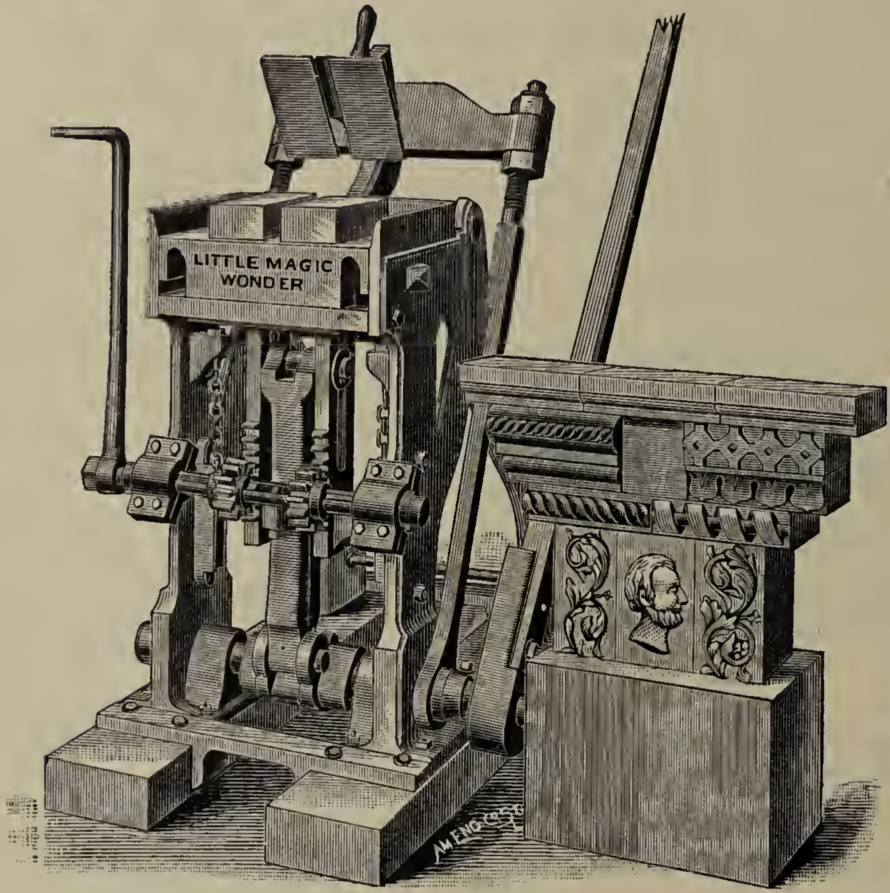
AKRON, O.

Manufacturers of Improved Clay Working Machinery of all kinds, such as Clay Mills, Dry and Wet Pans, the Barber Steam Sewer Pipe Press, Dies, Clay Blockers, Potters' Wheels and machinery of every description. Write for circulars.





The LITTLE MAGIC WONDER



It Will Do It!

Over 1,000 Different Patterns of Ornamental Bricks Can Be Made on this Wonderful Press.

Hear What a Prominent Brickmaker Says:

St. Louis, Feb. 3d, 1889.

Mr. Wm. Thaison, Austin, Texas:

DEAR SIR—At the end of a fair and satisfactory trial of your Little Magic Wonder Dry Clay Hand Brick Press, it affords me great pleasure to testify to its efficiency for the purpose intended. I had long been looking for just such a Press, whereon at short notice and at very slight expense we could, within a few hours' time get out small orders for ornamental bricks of special designs and patterns without interfering with the operation and working of our regular machines. The great value of your Hand Press to me, lies in the fact that we can make bricks upon it by pressure on edge as well as flat wise, thus enabling one to make almost any conceivable design of fancy moulded ornamental bricks. As you let your machines go out on trial there can come no loss to parties intending to purchase.

Very Respectfully, ANTHONY ITTNER.

Mr. Ittner runs two of these machines. His reputation as a gentleman and an expert brickmaker is so well and favorably known to the readers of the Clay-Worker that further comment is unnecessary.

☛For further particulars and circulars address

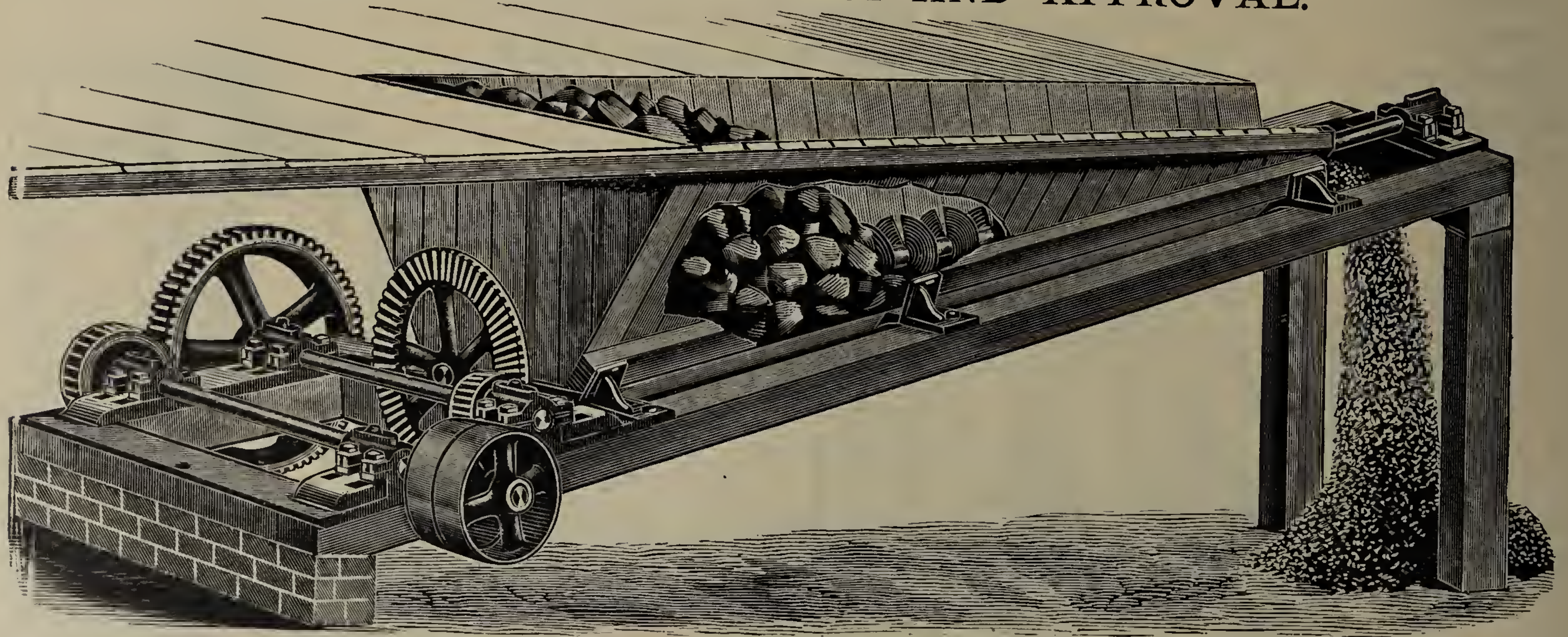
Lone Star Brick Machine Mfg. Co,

Mention the Clay-Worker.]

AUSTIN, TEXAS.

Emen's Patent Perfection Clay Granulator and Feeder.

SOLD SUBJECT TO TRIAL AND APPROVAL.



Saves time and labor and produces better ware; simple in construction; rapid and accurate in operation. Every brick, tile and sewer pipe manufacturer should investigate the merits of this machine.

During the past season it was introduced in several of the leading Chicago brickyards and is now at work giving entire satisfaction. Write for descriptive circulars.

Chambers Brothers Company, of Philadelphia, Pa., are licensed to manufacture and sell these machines.

EMENS AND COLE

[Mention Clay-Worker.]

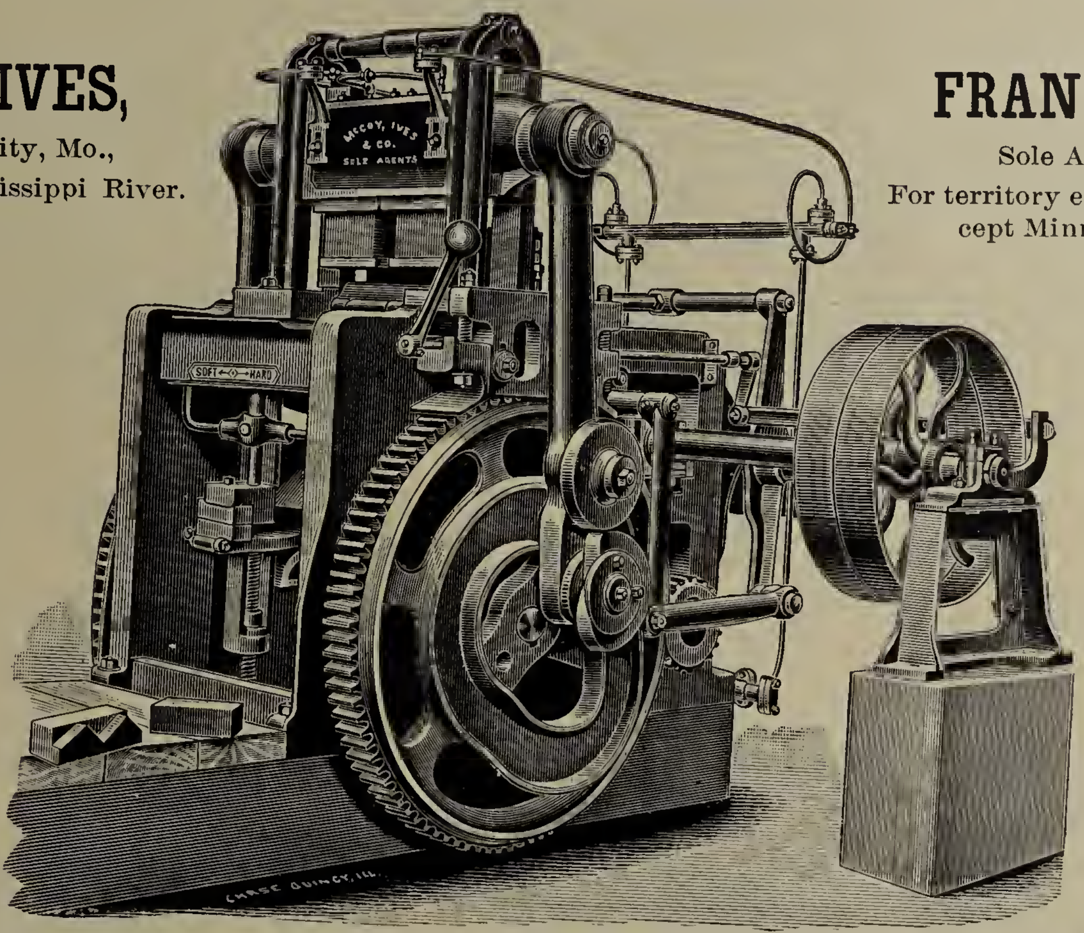
HOLTON, (MUSKEGON CO.) MICH.

WHITTAKER'S CELEBRATED
SEMI-DRY BRICK MACHINE

[Patented in U. S. May 13, 1884.]

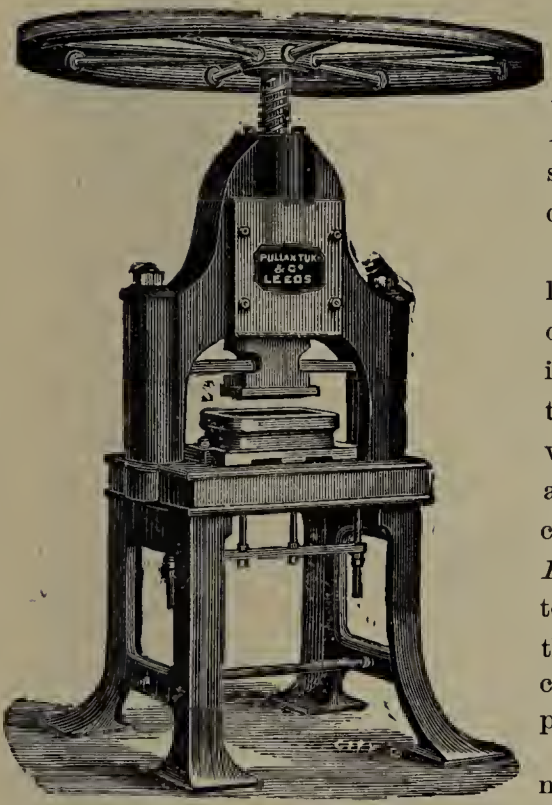
T. DWIGHT IVES,
Sole Agent, Kansas City, Mo.,
For territory west of Mississippi River.

FRANK D. BROWN,
Sole Agent, Quincy, Ills.,
For territory east of Mississippi River, except Minnesota and Wisconsin.

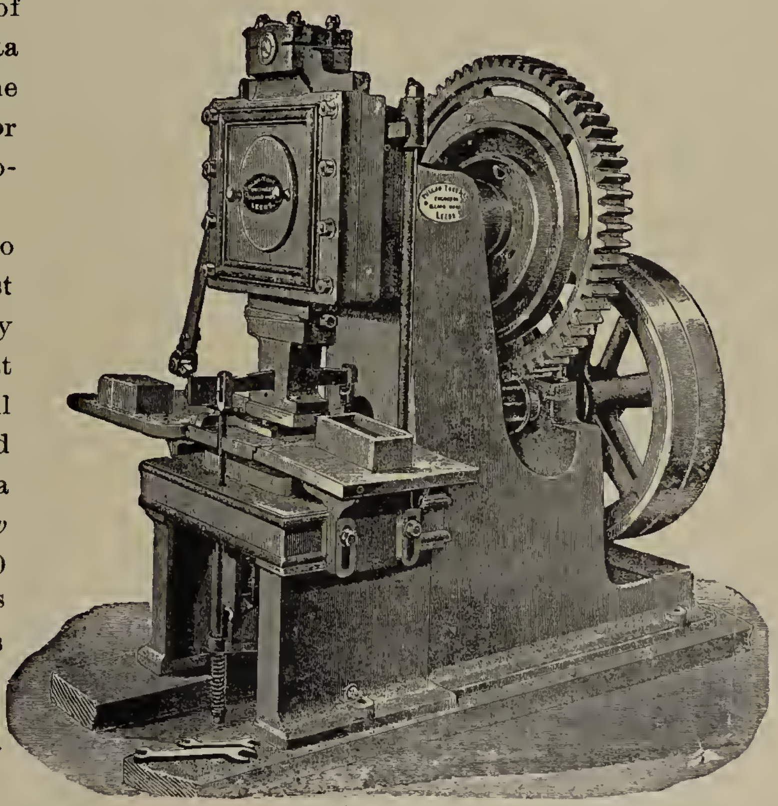


THE ONLY PERFECT BRICK MACHINE MADE.

Titlev's Patent Screw Press.



Pullan Tuke & Gill's Patent Steam Press



WE beg to call the attention of Brick, Tile and Terra Cotta Makers to these two Presses as the *Peers of any press on the market* for superiority of finish in the work produced.

The *Steam Press* is best adapted to large works and will produce the best quality of Front Bricks. Its capacity is 10,000 per day of the finest bricks at the smallest cost for labor. For small works and for all makers of moulded and ornamental bricks, tiles and terra cotta, we recommend the *Screw Press*. It will exert a pressure of 30 tons and is to-day *without a rival* as the *best press on the market*. Its capacity is 3,000 to 4,000 plain brick per day.

Send for circulars giving all information, with testimonials.

ALFRED CROSSLEY,

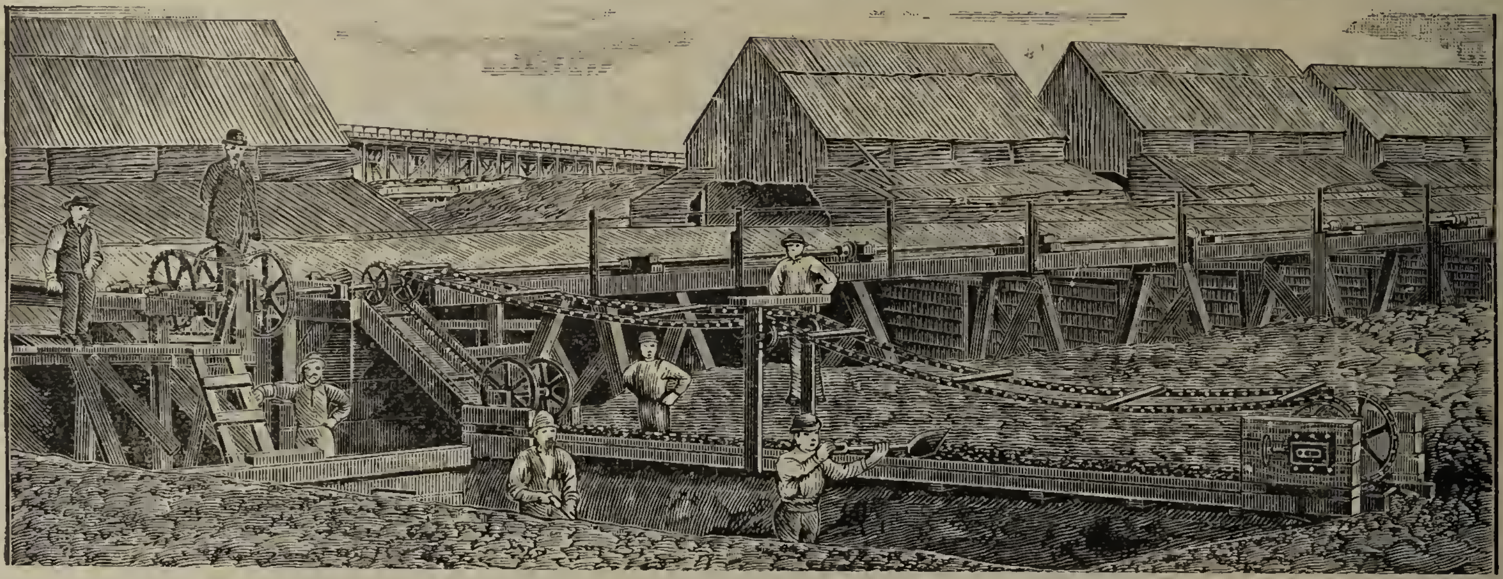
Sole Agent for the United States.

Chattanooga, Tenn.

(Mention the Clay-Worker.)

MEY'S CLAY ELEVATOR AND CONVEYOR,

This Elevator is for taking the clay into the brick machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.



It gives the machine a uniform feed, takes less power and manual labor to manipulate and the manufacturer is enabled to make many more thousands of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

It will carry either wet or dry clay and does not clog. There are many of them now in operation and giving satisfaction in every respect. For further particulars and for Catalogue, address

F. H. C. MEY, BUFFALO, N. Y., U. S. A.

THE NEW IMPROVED

CHIEF BRICK MACHINE.

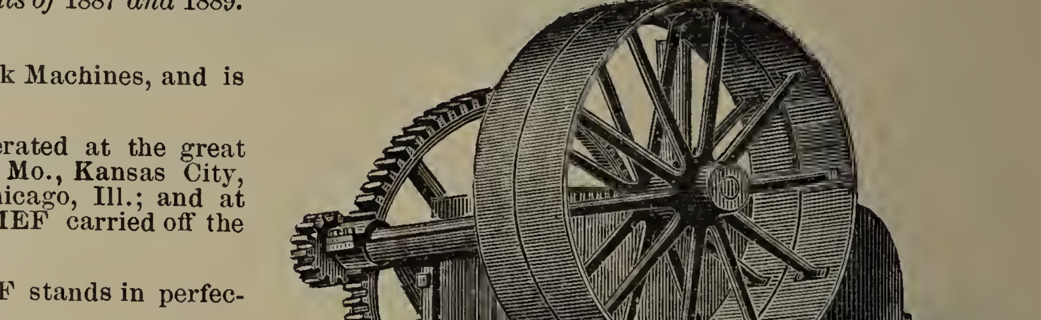
Patented Jan. 1, 1884, *April* 2, 1884, *and the new improvements of* 1887 *and* 1889.

Has taken the lead and stands at the head of all Brick Machines, and is now in operation in every State and Territory in the Union.

In its original construction it was exhibited and operated at the great Southern Exposition at Louisville, Ky.; also at St. Louis, Mo., Kansas City, Mo.; Indianapolis, Ind.; Columbus, O.; Cincinnati, O.; Chicago, Ill.; and at each and all places where premiums were awarded the CHIEF carried off the first prize medal over all competitors.

And with the late new improvements added the CHIEF stands in perfection, at the head of human inventions.

The NEW IMPROVED CHIEF is wonderful in operation, is all steel and iron, and of the greatest strength and durability, is easily operated, and with two horses or a small engine makes 60 to 100 perfect bricks per minute. Grinds, tempers and at the same time moulds into brick any clay. Stones in clay cannot break it, nor interfere with its free operation. It is easily transported, and changed from horse to steam power. It fills the moulds evenly and well until the machine is empty of clay, pressing each brick equally and solid, so all will shrink alike. The pressure can quickly be changed while the machine is running to suit the consistency of the clay. All shafts are of steel; main shaft runs in three boxes or bearings all outside of the machine into which mud or sand cannot penetrate. The wear can at all times be taken up so as to prevent leakage. The clay in the press box is under full control of the plunger, which is direct and positive, and prevents the mud from floating back into the mud drum; this feature is not found in any other mud machine.



Bricks made by the NEW IMPROVED CHIEF, are solid and perfect, and have sharp edges and corners, and do not crumble in burning.

The NEW IMPROVED CHIEF is equally suitable either for small or large yards, the best of bricks are made by it at the least labor and expense, all parts are easy of access and the bearings can be oiled from the outside. All ordinary sizes of brick as well as ornamental brick can be made on the NEW IMPROVED CHIEF and it is especially adapted to making fire brick of any shape with the least danger of breakage and the smallest per cent of lost brick.

The NEW IMPROVED CHIEF is sold on its merits, and warranted to be all that is claimed for it.

We will send Circulars and Testimonials of the NEW IMPROVED CHIEF BRICK MACHINE, New Departure Tile Machine, Engines, Etc., Etc., free to any address on application. Address

Anderson Foundry & Machine Works,

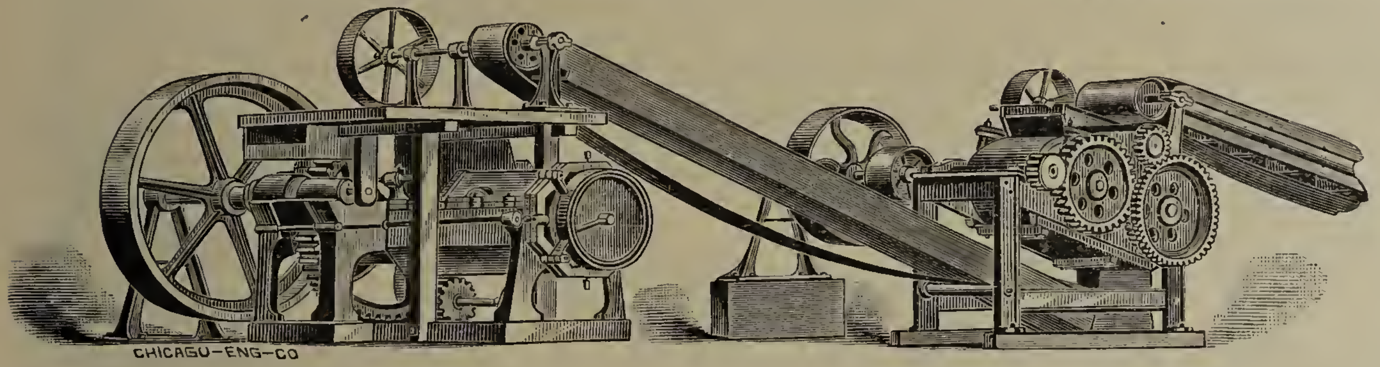
Mention the Clay-Worker.

Anderson, Indiana.

Adrian Brick and Tile Machine Co., Adrian, Mich.,

—MANUFACTURERS OF—

Brick and Tile Machinery,



Clay Crushers,

Engines

and boilers.

Also Daso's Builders' and Contractors' Elevators. Steam Fittings and Iron and Brass Castings Furnished to Order.

The working qualities of our machinery at its present state of development as estimated by one of the prominent Brick Manufacturing Companies of Kansas City, are stated in the following reply to a letter of inquiry addressed to them:

KANSAS CITY, MO., August 21, 1888.

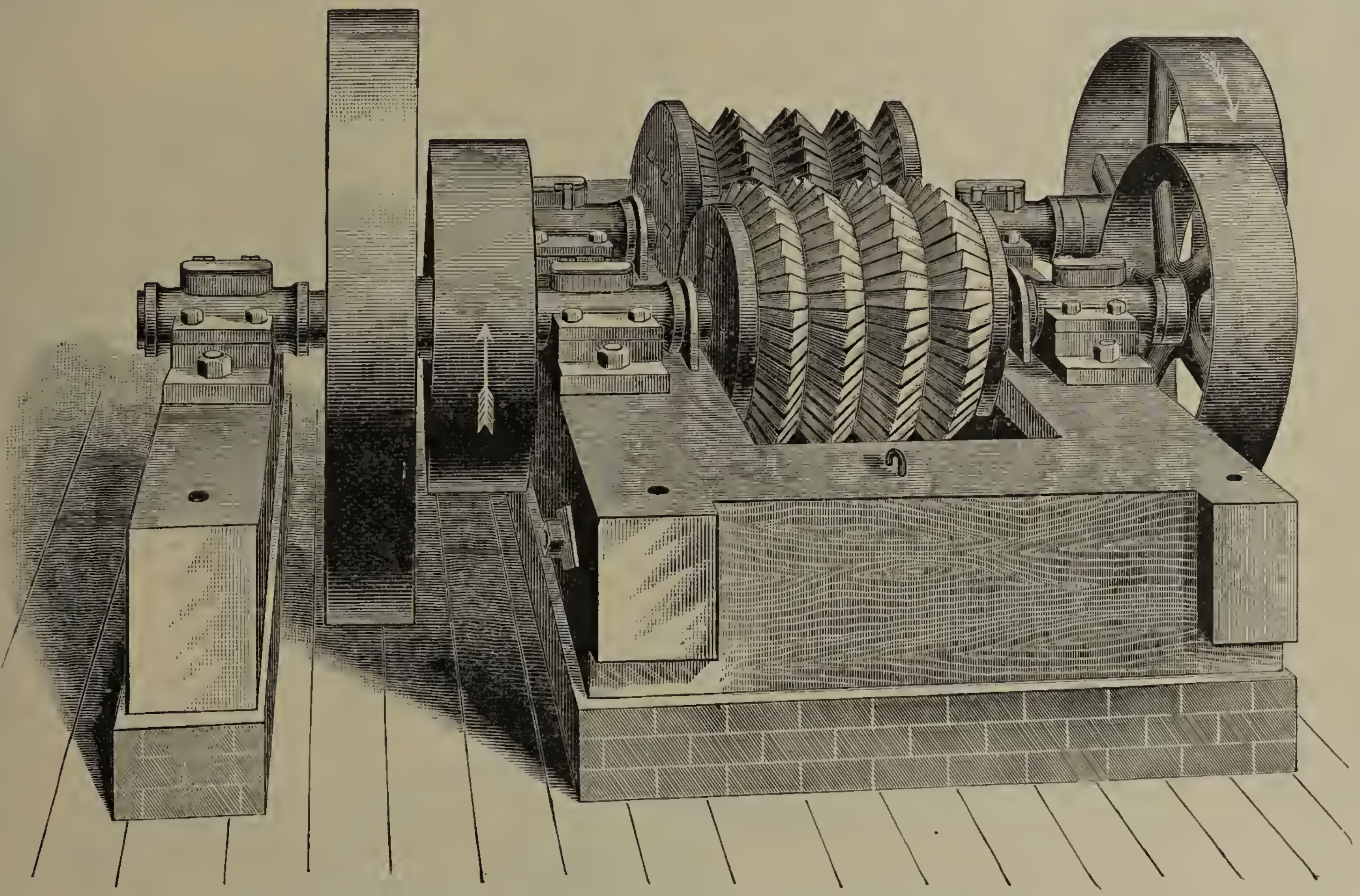
JOHN GIBSON, Esq., Monticello, Iowa:

DEAR SIR—In answer to your favor of the 16th will say, that we do not think there is any room for improvement in the Adrian Brick and Tile Machine Co's No. 4 Cut-off Table, as it cuts the brick as near perfect as possible, without tearing the edges; thus leaving the ends of the brick as perfect as the face. We are also using the new dies on both our machines, and are well pleased with them, as they are 100 per cent. better than the old style and turn out a perfect column of clay without warping or twisting. We have two No. 3 McKenzie machines and they are doing excellent work for us and we averaged during July, 26.800 brick, each, per day. In conclusion we will say that both the new tables and the new dies are so incomparably superior to the old ones that it gives us much pleasure to recommend them.

Very truly yours, SEDDON & EDWARDS BRICK CO.

NEWELL IMPROVED CLAY PULVERIZER

We Guarantee the Material and Workmanship and allow a Trial of our Machine to any Responsible Party.



NEW 19-INCH LETTER C PULVERIZER, WITH HOPPER REMOVED.

Heavy Cold Rolled Shafts running in best Anti-Friction Metal Bearings, protected from dirt.

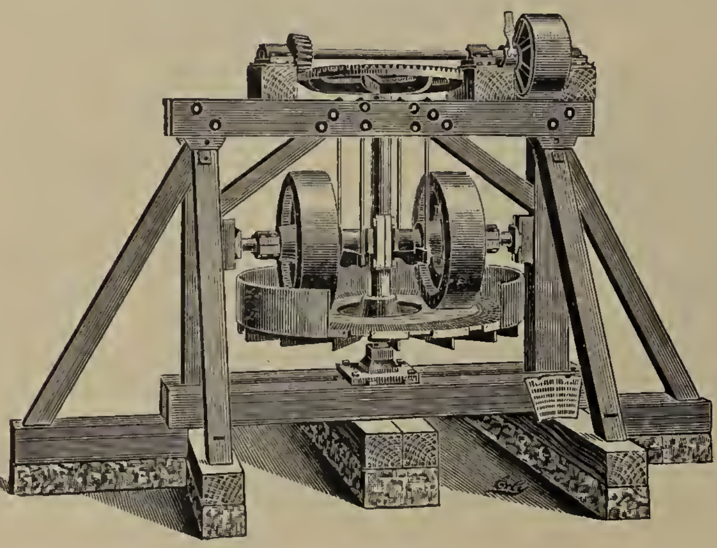
A FEW OF OUR CUSTOMERS AND REFERENCES:

Henry Maurer & Son, (3 Pulverizers) 420 E. 23rd St., New York City..
Peerless Brick Co., Philadelphia, Penn.
Perth Amboy Terra Cotta Co., (2 Pulverizers) Perth Amboy, N. J.
Syracuse Pressed Brick Co., Syracuse, New York.
Potomac Terra Cotta Co., (2 Pulverizers) Washington, D. C.
Siner & Brother, Frankford, Penn.
W. H. Perot, Baltimore, Md.
The Rathbun Co., Deseronto, Ontario, Canada.
Murrill Dobbins, (3 Pulverizers) Philadelphia, Penn.
American Brick & Tile Company, Phillipsburg, New Jersey.

Send for Illustrated Circular and Price List.

NEWELL UNIVERSAL MILL CO., - 21 Bethune St., NEW YORK.

THE FROST
Dry & Wet-Pan Crushers, Chasers, Etc.,



—FOR—

BRICK, TERRA-COTTA, SEWER PIPE AND FIRE CLAY.

—o—

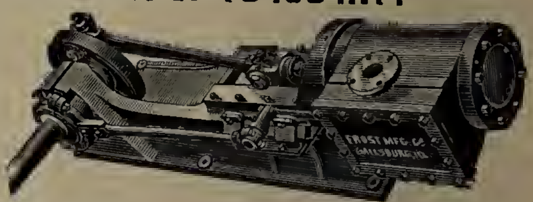
The best and cheapest machines made for working hard clay, soap stone, grog, etc.

Write for prices and other intromation.

THE FROST ENGINE CO.

GALESBURG, ILL.

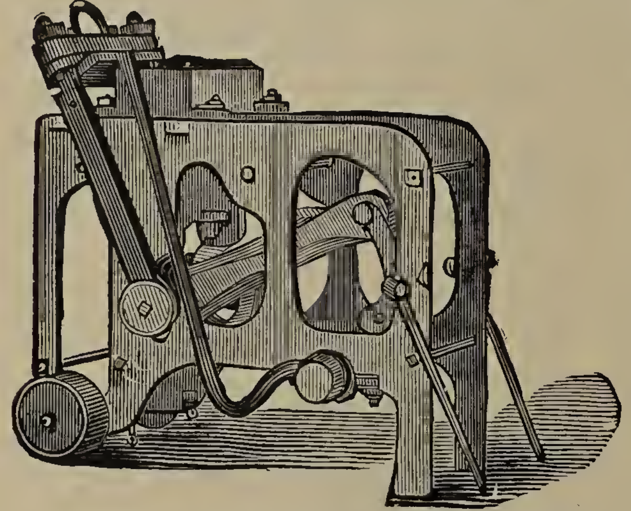
ALL SIZES UP TO 150 H.P.



ELEVATOR SUPPLIES

PULLEYS, SHAFTING, SPROCKETS, BUCKETS, BELTING, SHELLERS, CLEANERS, MILLS, &C.

SEND FOR CATALOGUES



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1819 and 1821 Germantown Avenue,
and Fifth St.,
PHILADELPHIA, PA.

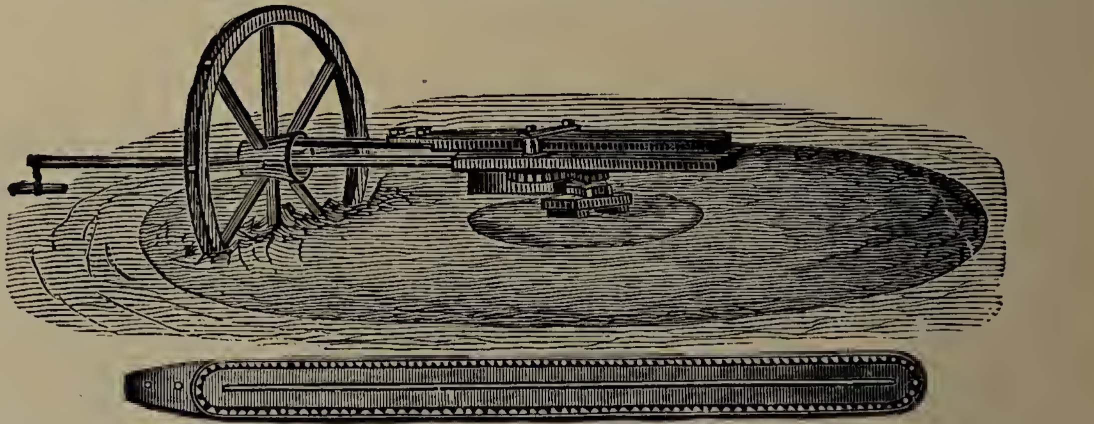
☞ Send for Circular and Price-List.

Philadelphia Brick Machine Works

—MANUFACTURER OF—

FIRE AND RED BRICK PRESSES.

Various sizes, from the smallest size up to 24 inches; also, manufacturer of **Clay Mills, Tempering Machinery,** and all kinds of **Brickmakers' Tools.**



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and is fitted up ten per cent. cheaper. ☞ Mention THE CLAY WORKER.

ESTABLISHED 1812,
AND CONTINUED ON THE SAME PREMISES EVER SINCE.

MILLER'S
BRICK PRESSES,

Introduced 1844 Latest Improved Patents, Aug. 28, 1883.

SAMUEL P. MILLER & SON,
MAUFACTURERS OF

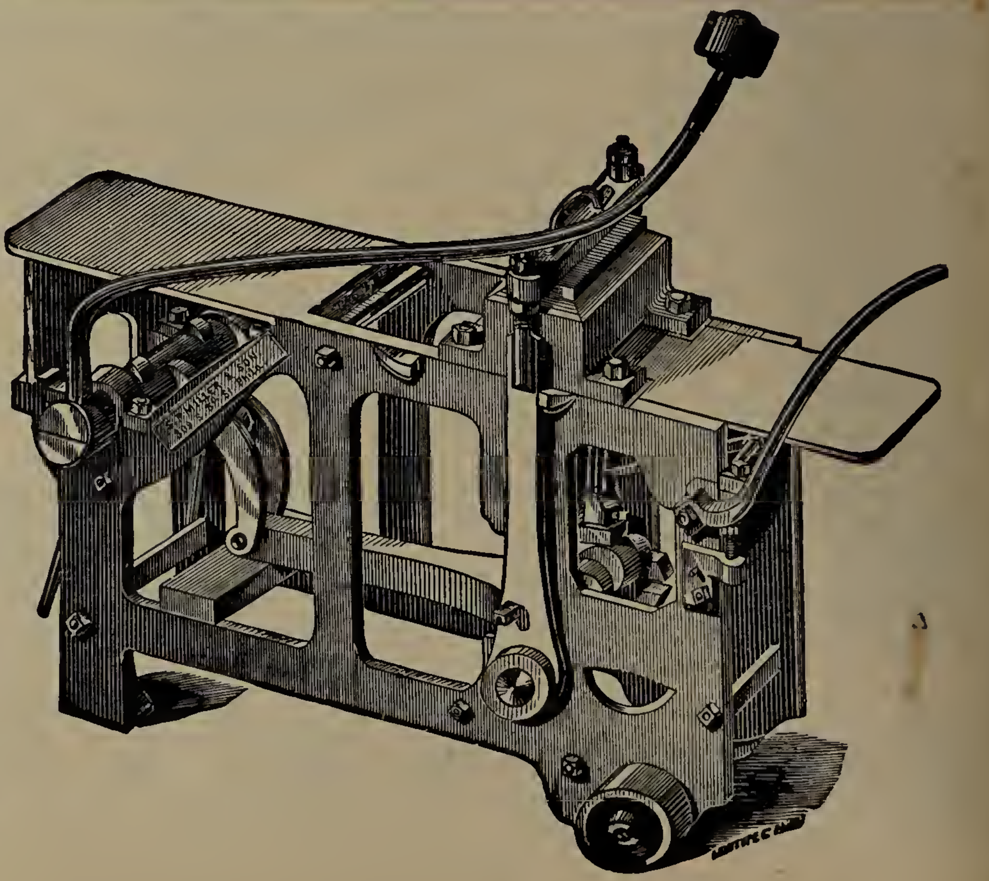
RED AND FIRE BRICK PRESSES,

Of five different styles, embodying all the improvements in Hand Brick Presses in use.

Clay Wheels with Reciprocating Rack, Kiln Castings, Brick Moulds, Clay Spades, and the Tools in General Use for Brick Making.

No. 309 SOUTH FIFTH ST., PHILADELPHIA, PA.

S. P. M. & Son refer to Brickmakers generally. ☞ Orders from abroad promptly attended to.

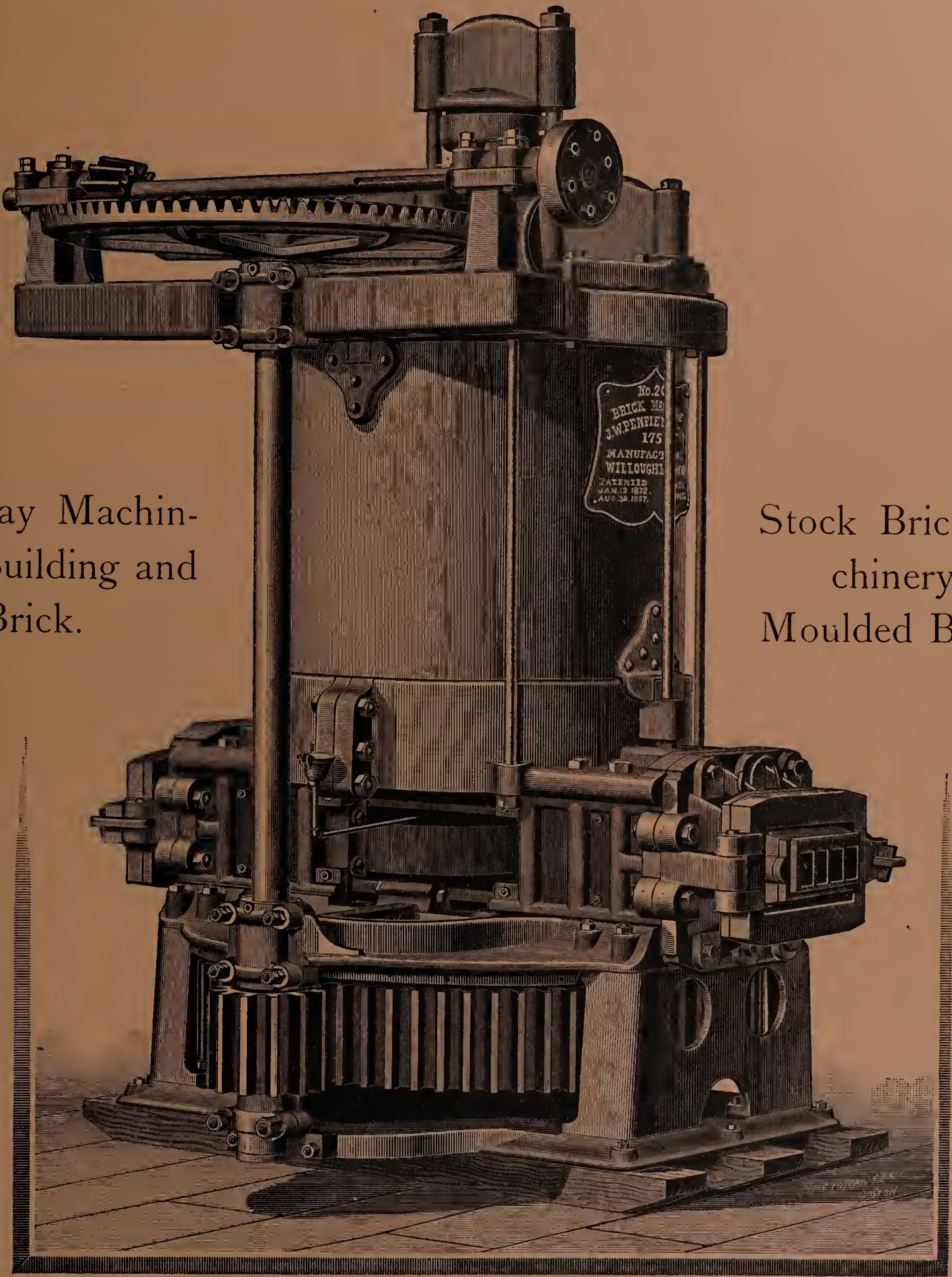


The Penfield Brick Machines

ARE UNEQUALLED!

Stiff Clay Machinery for Building and Paving Brick.

Stock Brick Machinery for sand Moulded Brick.



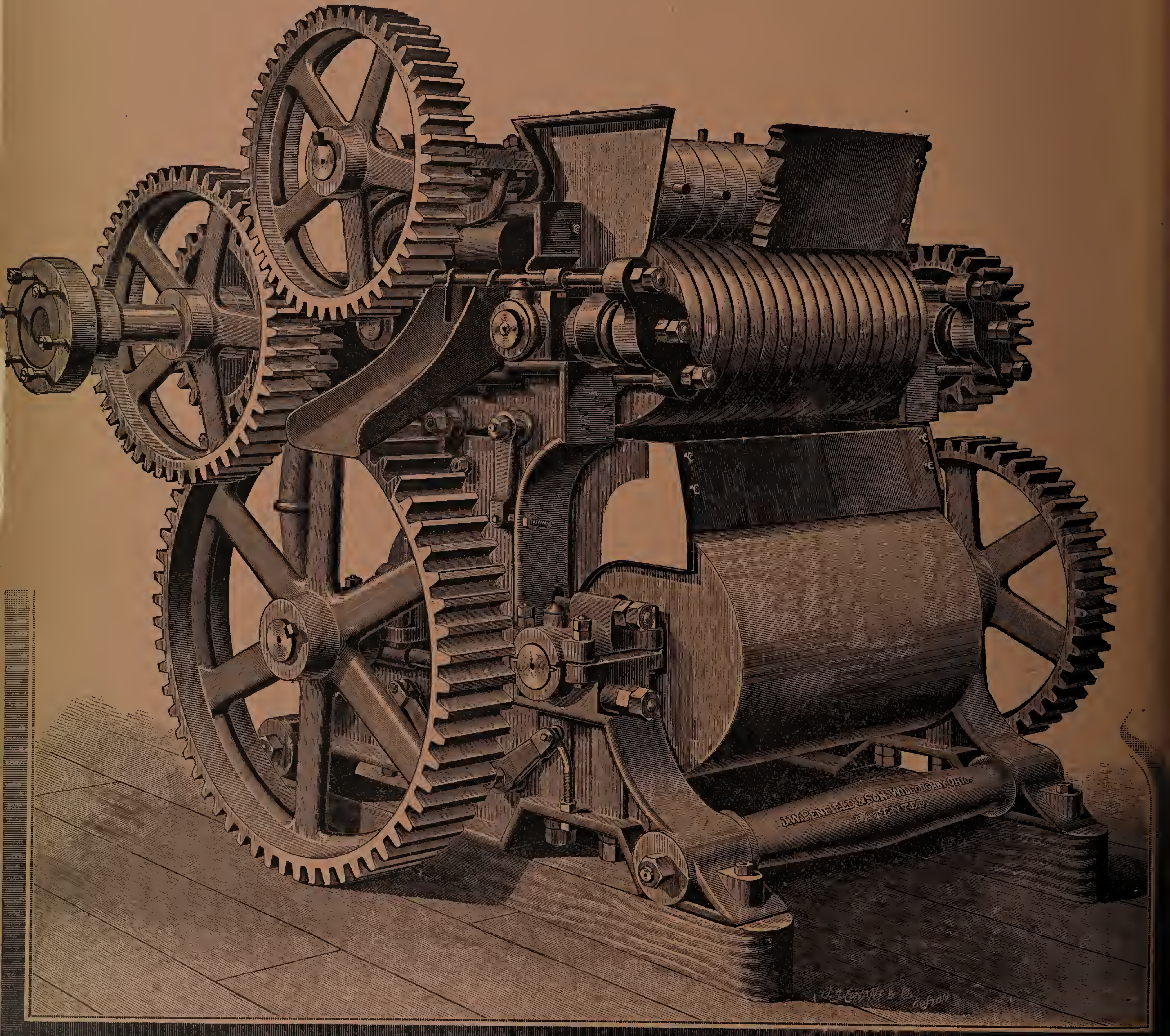
No. 20 "A" Brick Machine.

Pug Mills, Tile Machines, Elevators, Line Shafting, Pulleys, Hangers, Etc.

☛ For particulars address the manufacturers,

J. W. PENFIELD & SON, - Willoughby, Ohio, U. S. A.

THE PENFIELD
Clay Crushers and Stone Separators.


J. W. PENFIELD & SON, WILLOUGHBY, OHIO.
PATENTED.
J. S. CONANT & Co. BOSTON

No. 10 "D" Compound Crusher.

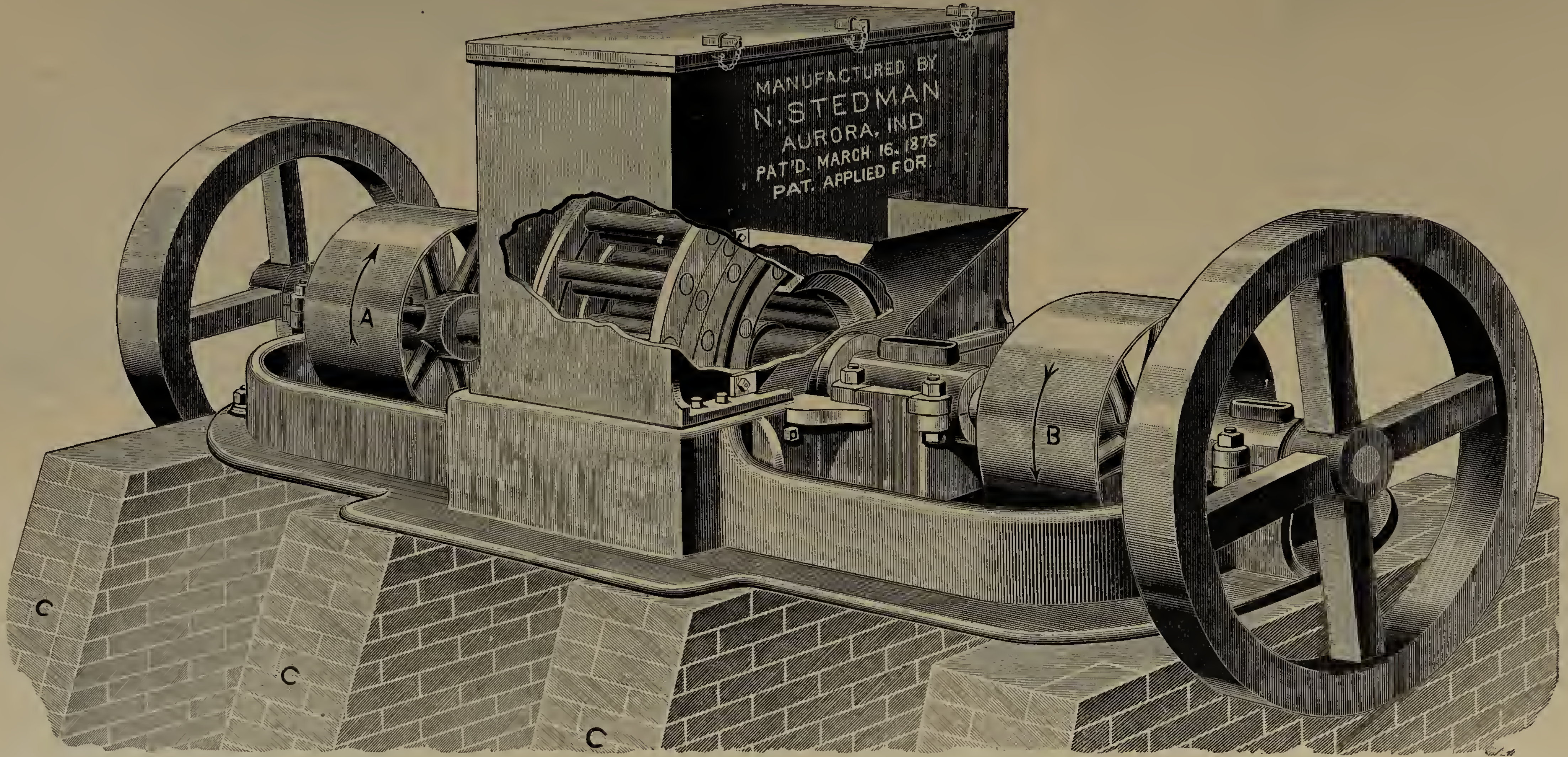
For further particulars, address the manufacturers,

J. W. PENFIELD & SON,

(Mention Clay-Worker.)

WILLOUGHBY, OHIO, U. S. A.

Stedman's Improved Disintegrator and Pulverizer.



To Brick, Tile and Pottery Men and to Terra Cotta Works, this Mill is invaluable. It reduces the clay to a fine, light and soft condition, with its full adhesive properties retained.

This mill will disintegrate or pulverize the following materials: Clay of all kinds, Shale and Slate direct from the bank for Brick and Tile, Fire Clay and Sand Stone Rock—for Cement and Fire Brick—Iron Ores of various kinds, Guano, Phosphates, Bones—green, dry and steamed—Tankage, Bone-Ash, Salt Cake, Soda, Cracklings, Oyster Shells, Animal Matter in almost all conditions, Old Fire Brick and Tiles, Old Pottery Ware, Plastic Clay, Asbestos, and in fact, almost any material that can be disintegrated.

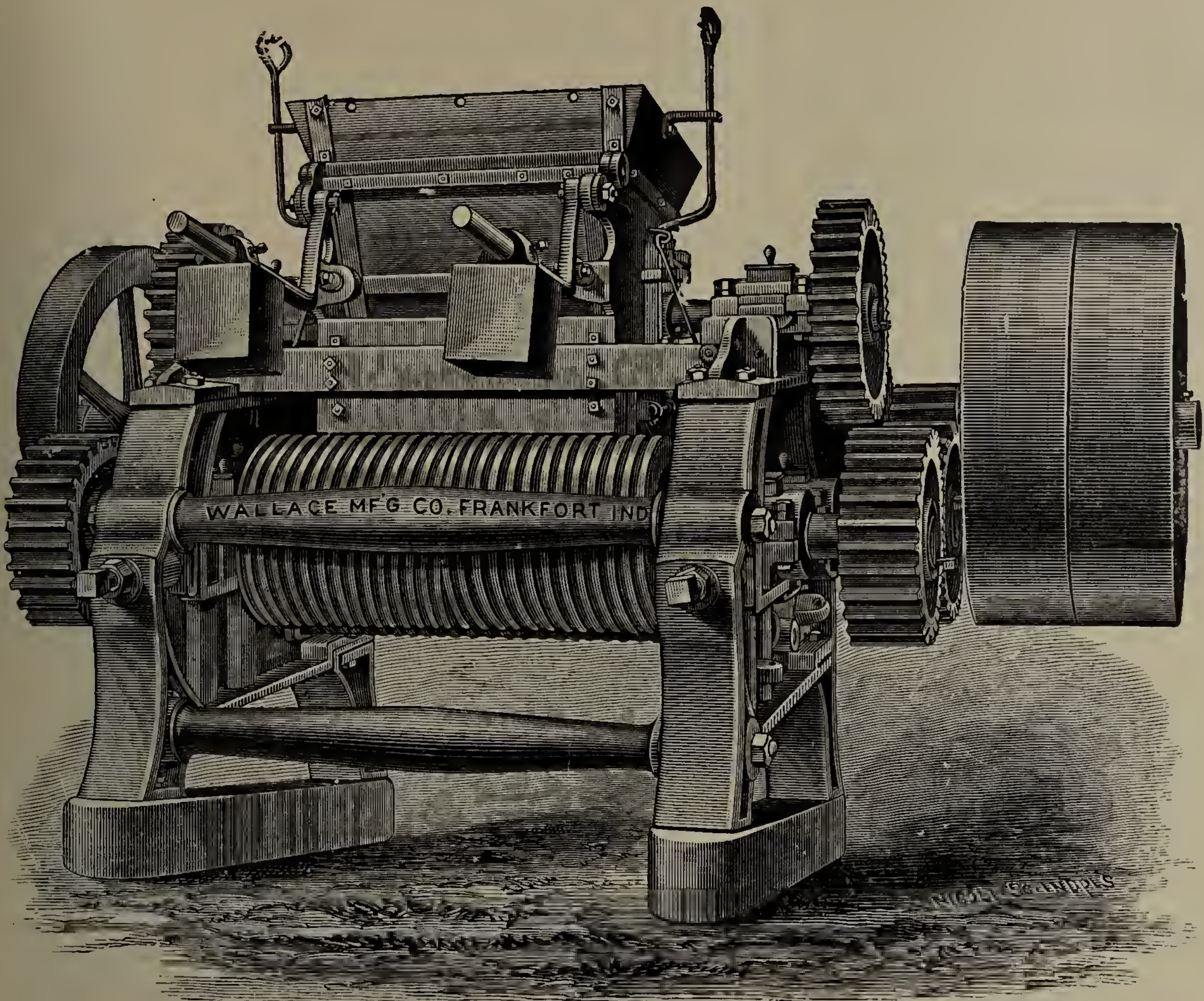
A good Disintegrator and Pulverizer is a long felt want in many branches of business. This Mill is an improvement over any yet made and is the result of practical experience. It is made in three sizes: 30, 40 and 48 inches. The capacity for clay is as follows: 34-inch Mill will pulverize for from 15,000 to 25,000 brick per day. 40-inch Mill will pulverize for from 20,000 to 35,000 brick per day. 48-inch Mill will pulverize for from 75,000 to 100,000 brick per day. For prices and further information, address

STEDMAN'S FOUNDRY AND MACHINE WORKS,

AURORA, IND.

PROTECTED BY PATENTS.

Mention the Clay-Worker.

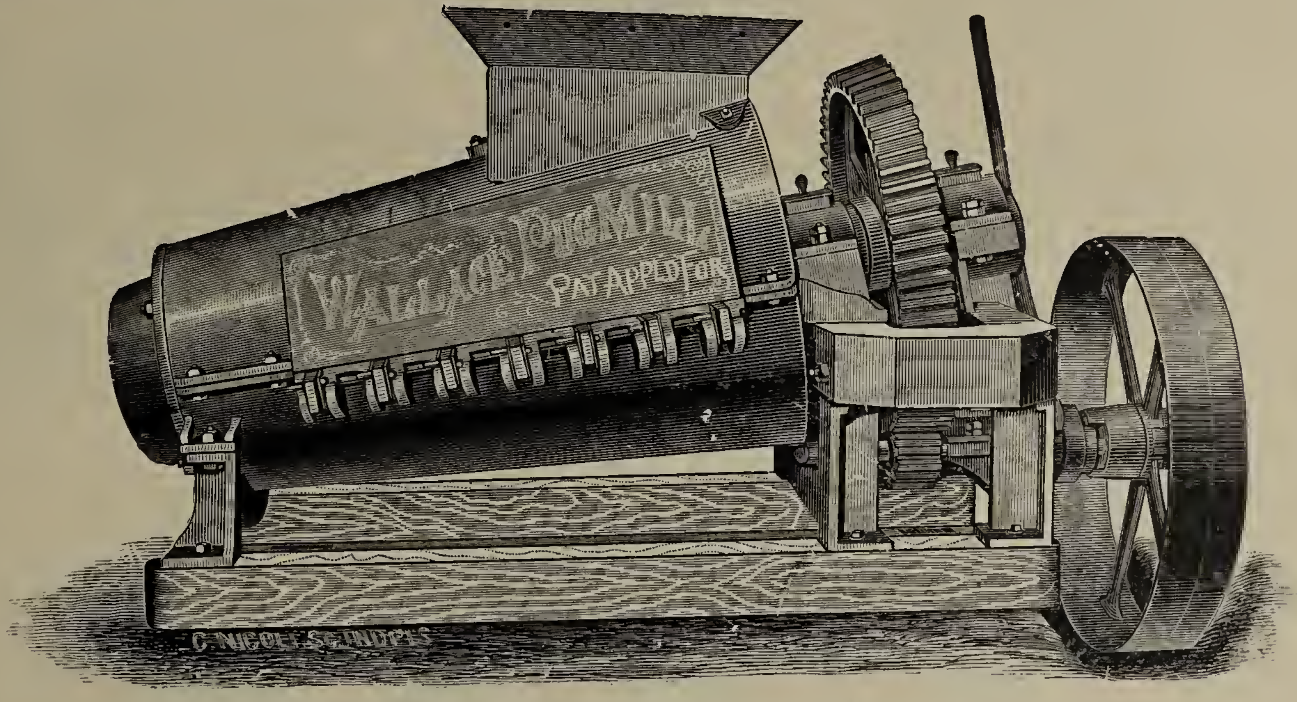

WALLACE MFG CO. FRANKFORT IND.
NICOLL & SNIPPS

THE WALLACE NO. 4, OR "JUMBO CLAY CRUSHER AND STONE SEPARATOR.

Largest size of our family of Clay Crushers.

We manufacture a full line of Clay-Workers' supplies.

Write and ask why we turned these cuts upside down, also particulars regarding our full line of Clay-Working Machinery.



WE MAKE TWO SIZES OF WALLACE PUG MILL—NO. 1 AND NO. 2.

WALLACE MANUFACTURING COMPANY,
LITTLE WONDER
BRICK MACHINE.
Frankfort, Ind.
25.000 CAPACITY.

Big and Little Wonder with Automatic Cutting Tables.

WALLACE MANUFACTURING CO.,

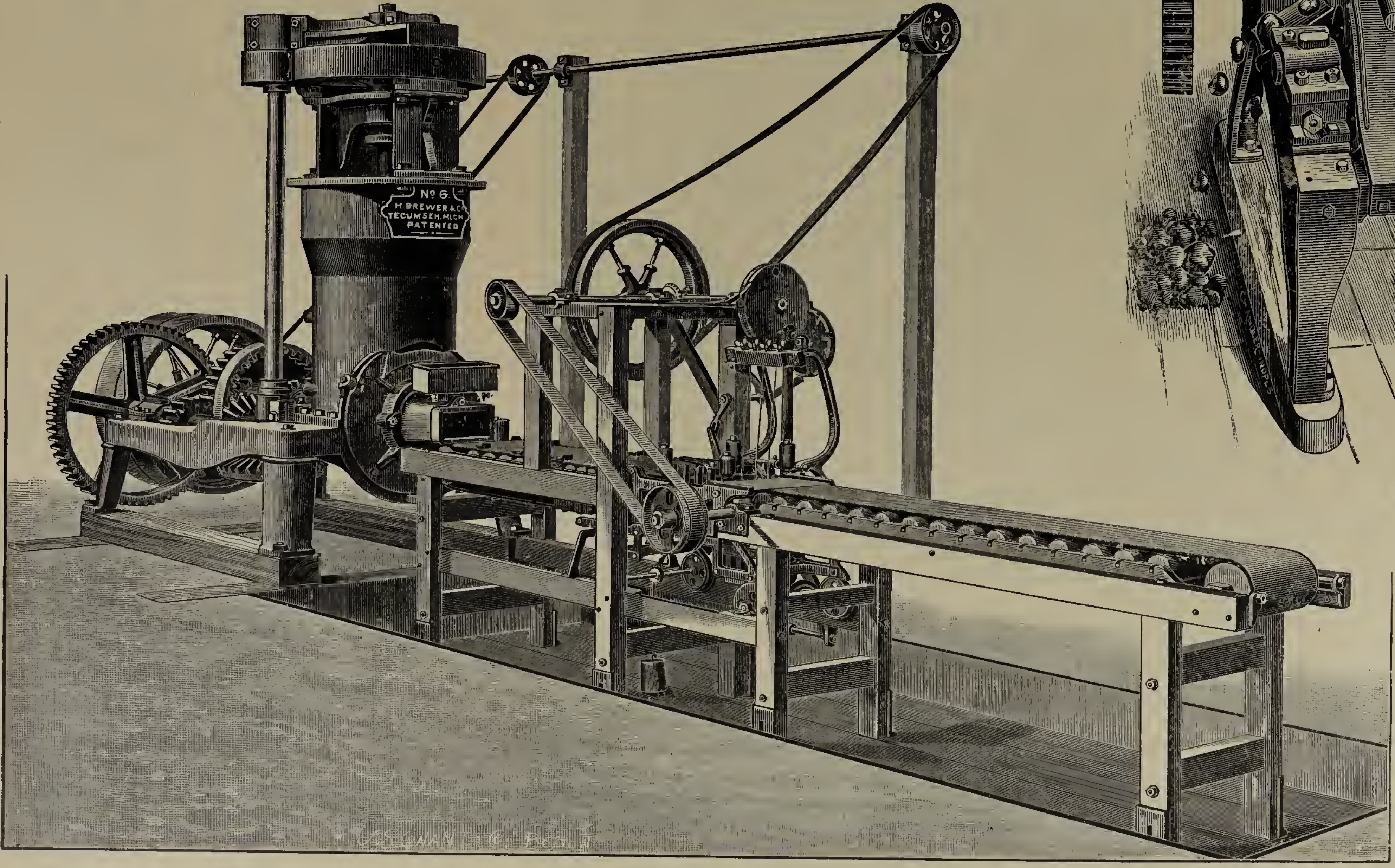
(Mention Clay-Worker.)

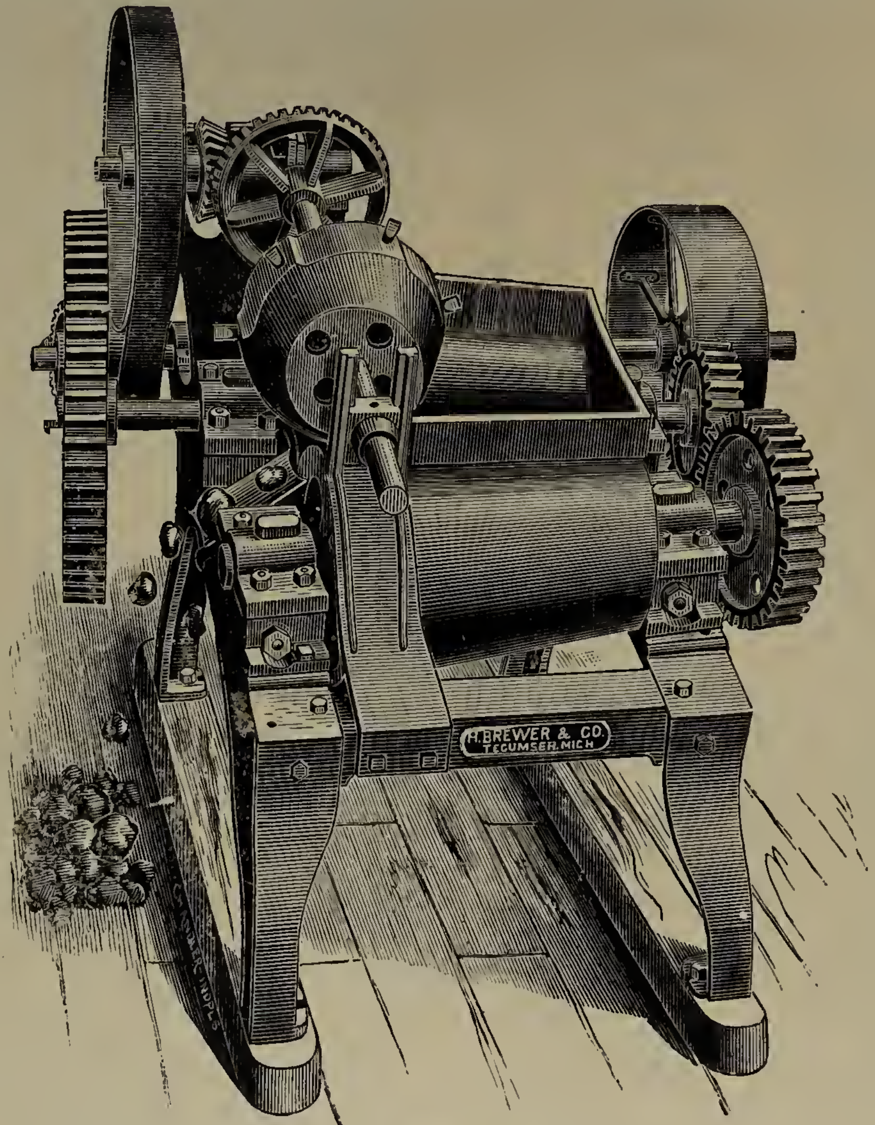
FRANKFORT, INDIANA.

NO. 6 BRICK MACHINE WITH LUBRICATING DIE AND AUTOMATIC CUTTER.

The machine grinds the clay so thoroughly that for most clays no additional Pug Mill is required. The brick issue from the die with perfect corners and are cut automatically to the desired size. The cutter can be arranged for either side or end-cut brick. It does the work equally as well as a hand cutter and saves the expense of a man. The number of brick which it will cut is limited only by the capacity of the machine. Hand cutters can be furnished where desired. Attachments for making all sizes of tile from 3-inch to 15-inch, can be procured at a moderate expense. RECENT IMPROVEMENTS have been added which render the No. 6 especially valuable for tile making. For full information address

H. BREWER & CO., Tecumseh, Mich.




H. BREWER & CO.
TECUMSEH, MICH.

H. BREWER & CO'S COMBINED CLAY CRUSHER AND STONE SEPARATOR.

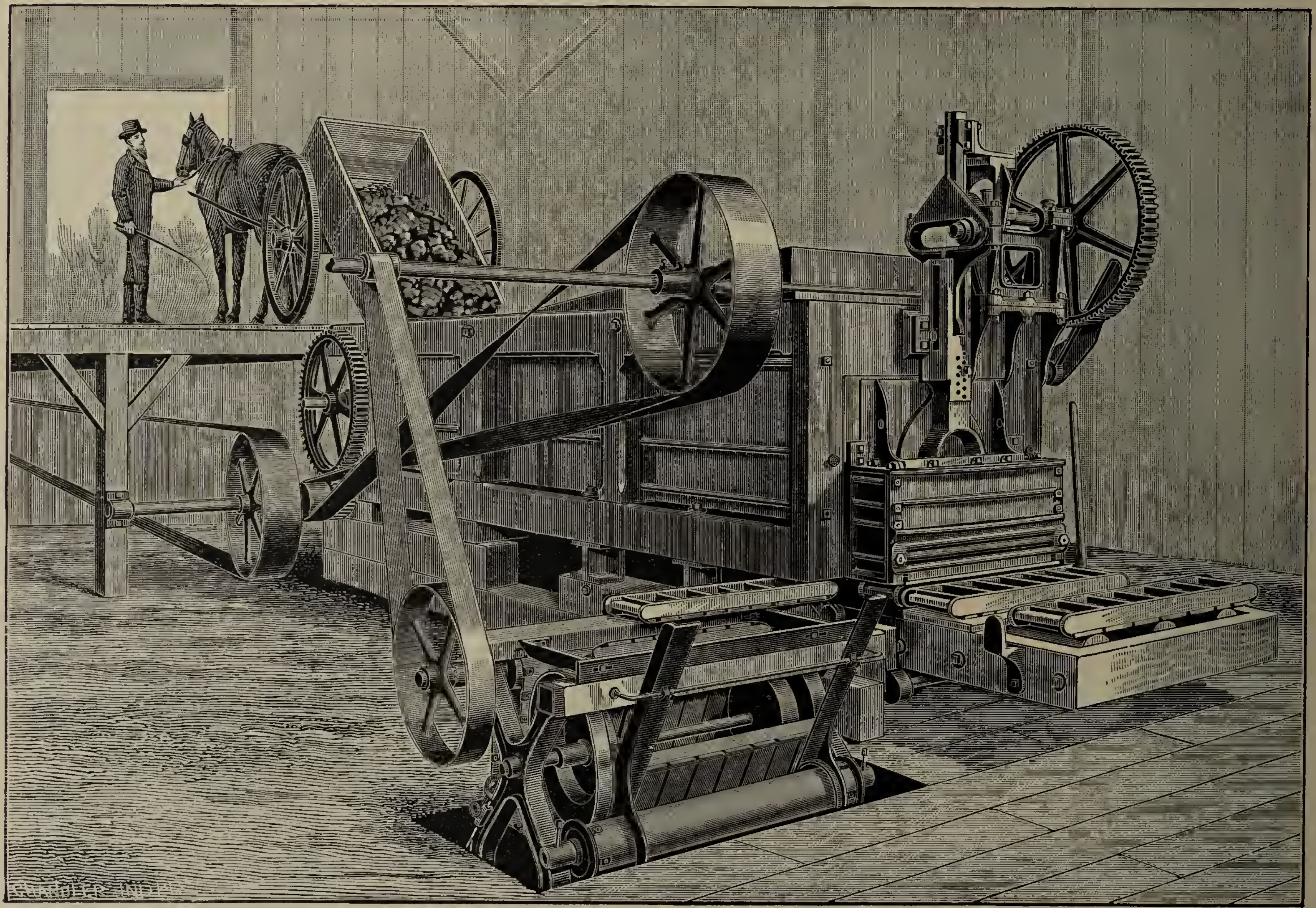
The prominent feature in this Crusher is the combination of two smooth, tapering crushing rolls running at different speeds, in connection with an adjustable transverse roll which is of irregular form and provided with teeth or spurs whereby the clay is rapidly broken up and crushed and the stone separated therefrom.

A GRAND SUCCESS

AND

Has no equal for Strength, Durability, Quantity and Quality of Brick Made.

Working the clay direct from the bank without use of extra Pug Mill.



It has the **largest tempering capacity** of any machine on the market.

All brick made have **clean, smooth** surfaces and **sharp corners.**

It has no springs or light complicated parts to get out of order, and cause delays.

No working part underneath machine where dirt and dust can collect and cause them to wear rapidly. All parts are out where they can be **kept clean** and **oiled.**

We are prepared to erect complete plants of any desired capacity and keep in stock a full line of **Brick Machines, Pug Mills, Disintegrators, Mould Sanders, Clay Cars** and **Drums.**

Do not fail to write for prices and catalogue.

C. & A. POTTS & CO.,

[Mention this paper.]

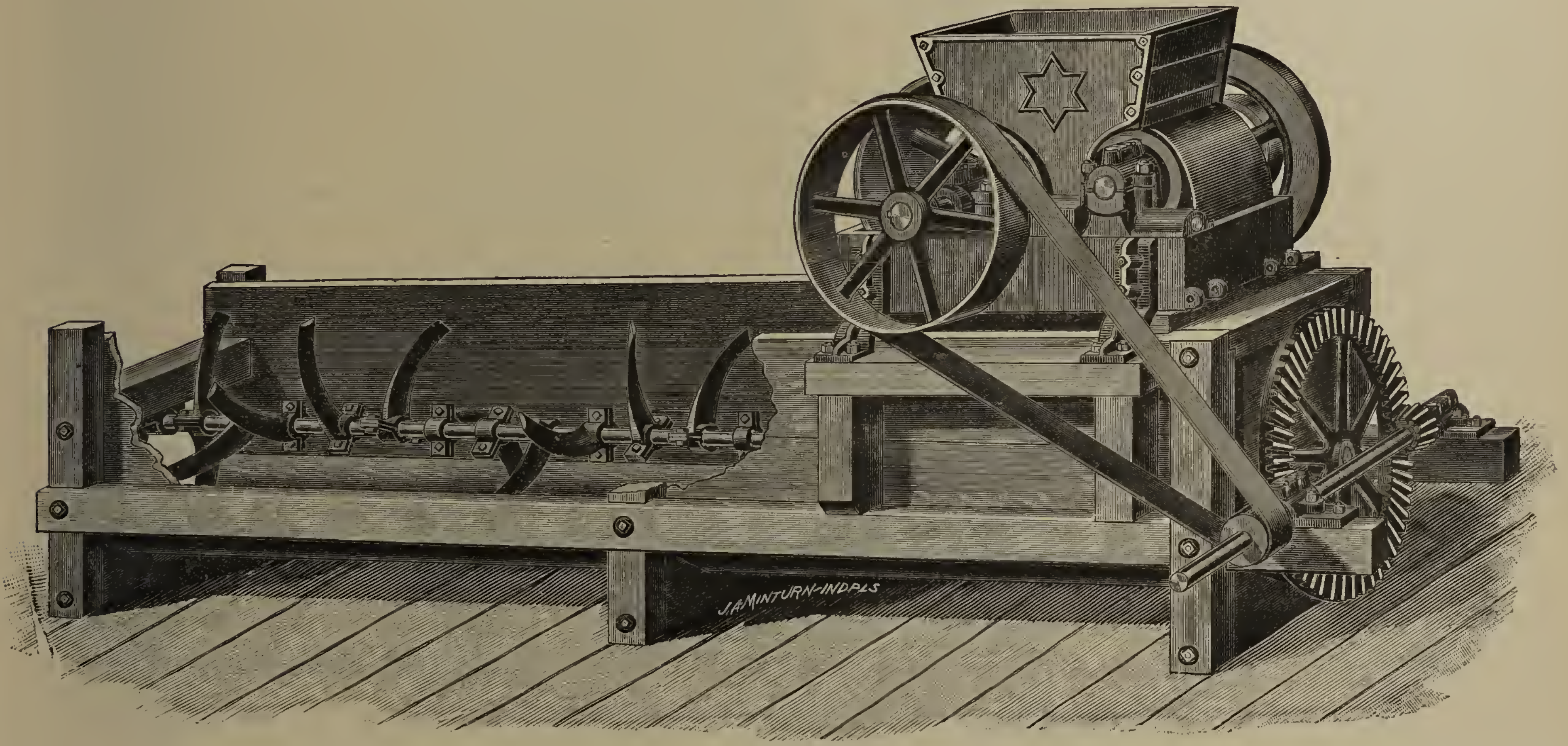
INDIANAPOLIS, INDIANA.

BRICKMAKERS!

IF

You are intending to make IMPROVEMENTS in your plant there is no machinery you can purchase which will make as large saving for the amount of money invested and improve the quality of Brick made as our COMBINED PUG MILL and DISINTEGRATOR.

It will work the clay direct from bank, saving all PIT SOAKING, and extra handling of clays, as well as $5 to $6 per day in labor.



The Disintegrator will thoroughly pulverize all lumps and clods, dry or wet, it does not clog or choke as roller crushers do, the clay is ground fine and is in the best possible condition to take water.

Our machinery is strong and durable, has no light or complicated parts to wear or break.

A WARNING.

Jonathan Creager's Sons, of Cincinnati, Ohio, are now manufacturing a Clay Disintegrator which is an infringement on our Patents. We have brought suit against them in the United States Circuit Court for the Southern District of Ohio.

We presume that this will be accepted as a sufficient answer to their statements in May number of Clay-Worker that our former notice was meant for bluff only.

We intend fully to protect our rights, and only waited until it was apparent that they were being wilfully infringed to bring suit.

Our Patents are numbers 322,393, *dated July 14th,* 1885, 368,898 *dated August 28th,* 1887, *and* 384,278 *dated June 12th,* 1888.

☞Write for prices and terms.

C. & A. POTTS & CO., - - Indianapolis, Ind.

Have You Watched Our Growth?

ENTIRELY ON MERIT.

Many of you have invested your money in a brick machine because it was represented to be—as good as the "Grand Automatic." in every case the machine sold was represented to work the clay *just as stiff* as it is possible to work tempered clay. You bought the machine on the strength of such statements, but your experience taught you that all these claims were false. In other words, you were taken in to the tune of some $500 or $600 or more. The machine man had your money and you had the experience. Also you are probably informed that it is claimed for some mud machines to mould (in the ordinary wood mould) 5 and 6 brick to the plunge, brick so stiff as to be haked 5 to 8 high, direct from the machine.

Now we ask any honest brickmaker—is this practical? All clays are not alike; much depends on the quality of the moulding sand. Any first class machine should be capable (ours is at least) of plunging clay so stiff and hard as to make it impossible to deliver from the mould. Brickmakers should carefully dissect all such broad claims, use a little common sense judgment and not contribute toward the maintenance of high salaried salesmen whose very existence depends upon the number of machines they get rid of. A moment's consideration just now may save you much swearing and considerable money the coming season. We offer our "Automatic," embracing such valuable improvements as Relief Pitman, Supporting Arch, (Iron Rails where wanted) or all iron bottom, in direct competition to any and all machines offered for the purpose of making brick. Your investigations and comparisons cannot be too searching to please us.

Some competitors argue that we sell too good a machine for too low a price, that we hurt the market. Our reply: We offer an Honest Machine at an Honest Price and Honestly Represented in every particular. We would advise not to invest A DOLLAR until you have either called at our works or written us for particulars. Of course we do not expect to supply all the brick machines to be used; that would be impossible. Still, we shall make a big effort to fill all orders as promptly as possible and would now advise intending purchasers to place their orders as much in advance as possible to prevent the delays attending the usual spring rush. We will make it an inducement to order now. Your correspondence is cordially solicited. No trouble to give information.

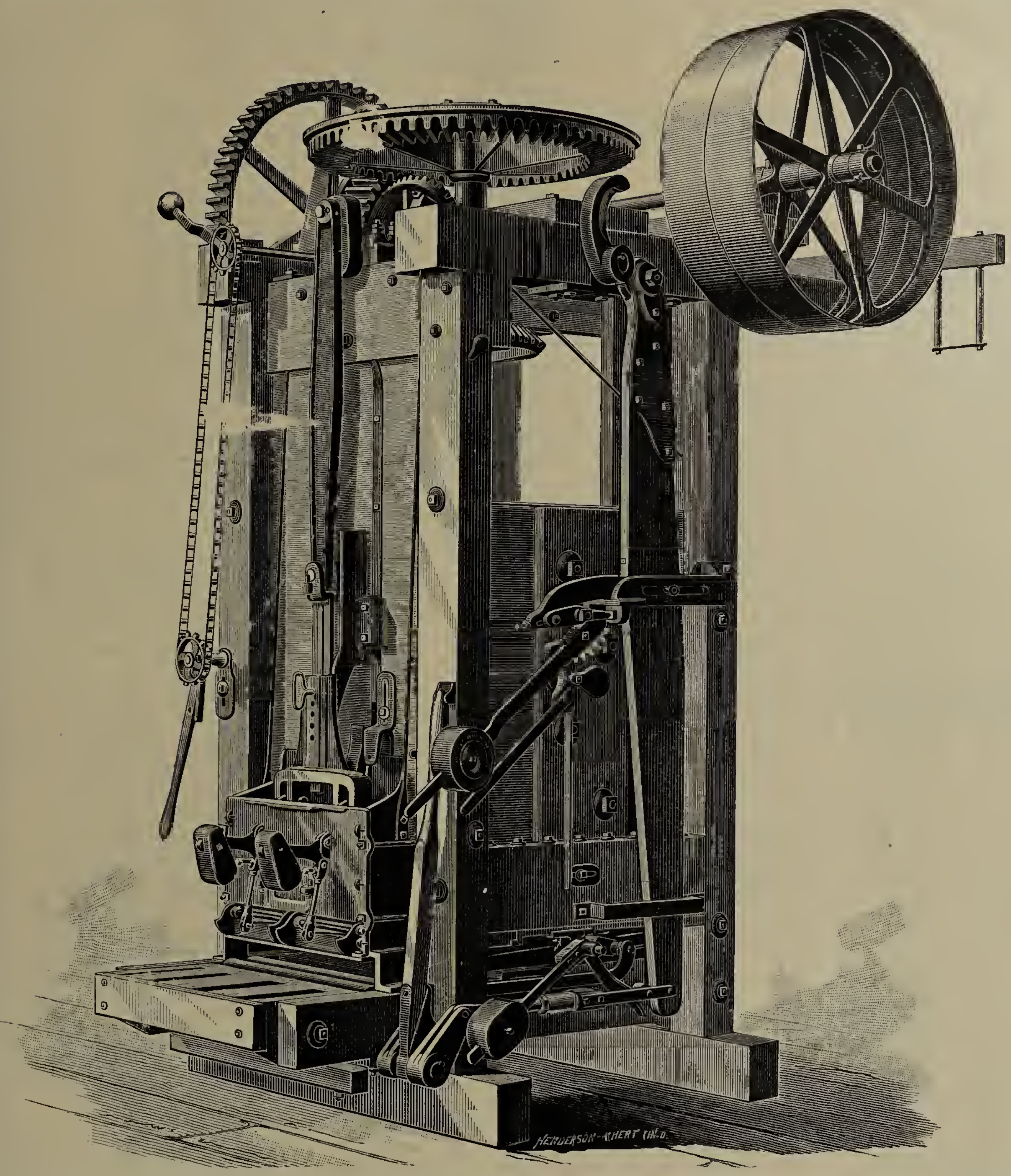
Send for complete catalogue

Jonathan Creager's Sons,

Mention the Clay-Worker.

Cincinnati, Ohio.

The "Tiffin" AUTOMATIC Brick Machine.


HENDERSON-ACHERT LITH. CO.

The "Tiffin" **Automatic** Brick Machine is, **beyond question**, the best machine of its class in the market. It is **Heavy, Strong** and **Durable. IT IS GUARANTEED TO DO GOOD WORK.**

The **"TIFFIN"** is made for use by **Steam**, or **Horse** power. The capacity of the **Horse Power Machine** is 18,000 to 20,000 per day, and of the **Steam Power** 25,000 to 40,000 per day, according to the speed at which they are operated.

Both styles are equipped with our **Automatic "Stone Doors,"** which permits a stone, or any other hard substance, that may have passed in with the clay, to pass out **without breakage to the Machine.**

PRICES:

Steam Power Machine	$350.00
Horse Power Machine	$250.00

The principal shafts are of Steel, and all other material used, is **First Class. Competent Workmen Only Employed** in their onstruction. These machines have been **Thoroughly Tested** in the hands of **Experienced Brickmakers** during the past season, and with the most **Satisfactory** results to them. Parties who may be **Interested Enough** to wish to make inquiry, will be given the names and address of the parties who have had them in use.

We are the makers of the **CELEBRATED "OLD RELIABLE"** Brick Machine, for use by hand power, which is so well and favorably known to the Brickmakers of the entire country. We are also manufacturers of Turn Tables, Trucks, Wheel Barrows Molds, Kiln Doors, Etc., Etc. Correspondence solicited.

TIFFIN AGRICULTURAL WORKS,

[Mention the Clay-Worker.] **TIFFIN, OHIO.**

THE FREY-SHECKLER CO.,

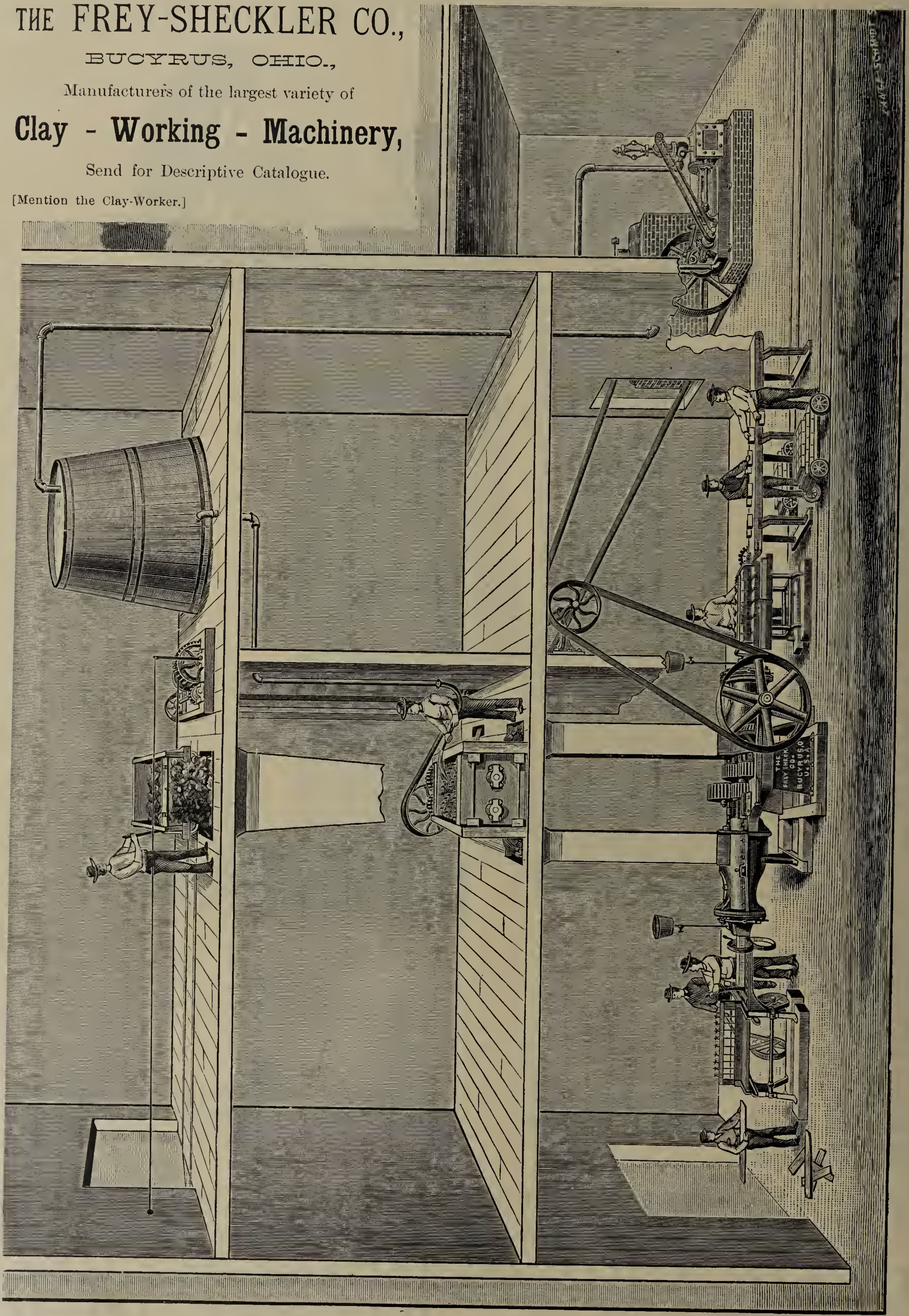
BUCYRUS, OHIO.,

Manufacturers of the largest variety of

Clay - Working - Machinery,

Send for Descriptive Catalogue.

[Mention the Clay-Worker.]

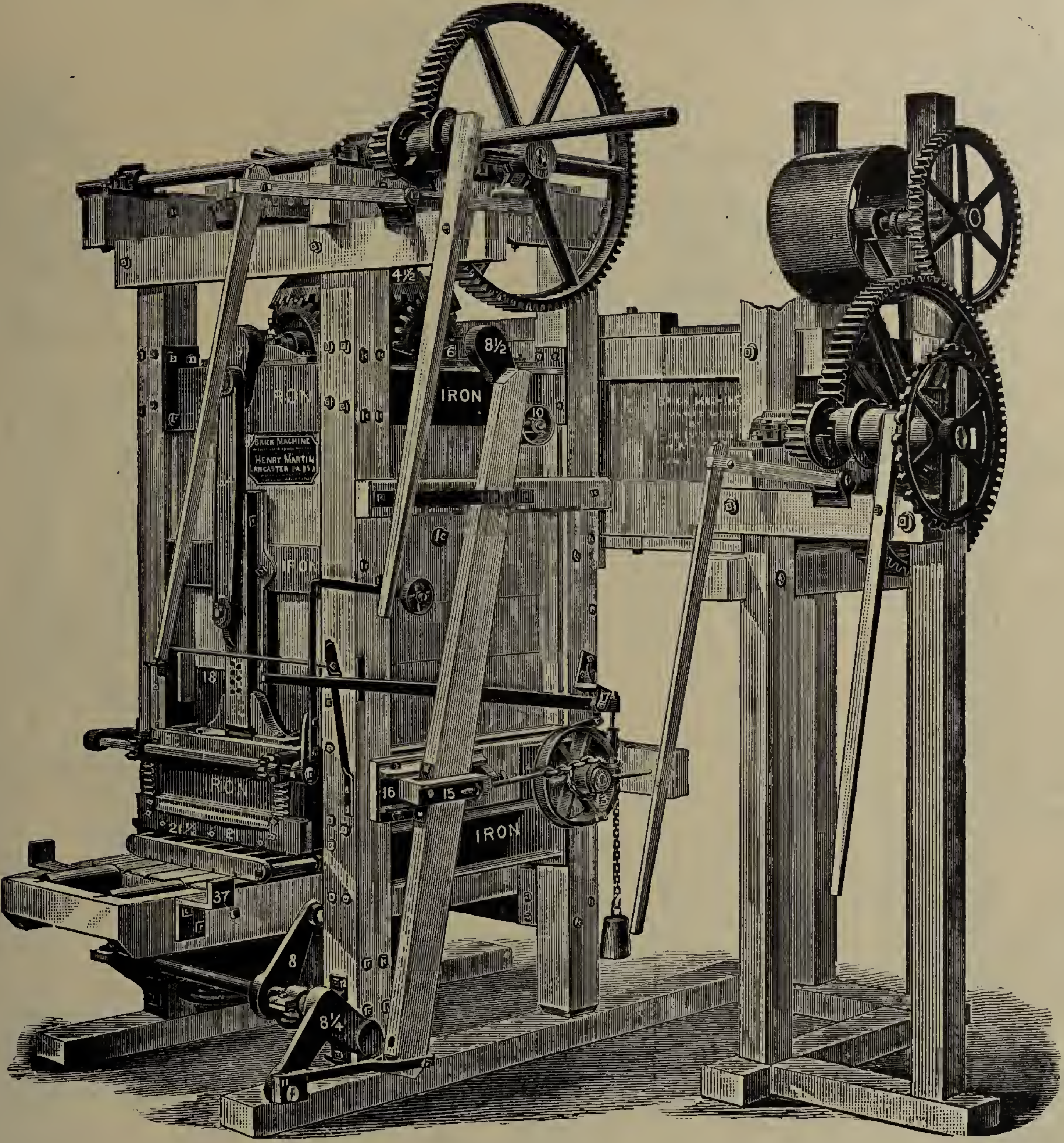

THE FREY SHECKLER CO. BUCYRUS O. U.S.A.

BRICK FACTORY WITH DOUBLE ACME BRICK MACHINE AND PUG MILL.

The Henry Martin Brick Machine.

For Steam or Horse-Power.

WITH OR WITHOUT PUG MILL



WITH OR WITHOUT PUG MILL.

This cut represents our Steam-Power Machine and Pug Mill combined. It is the strongest. It is the best. It is the most simple. It is the most perfect. It does the best work. It works any clay. It does not get out of order. It is not liable to break down. It stands hard usage.

BETTER THAN EVER

Our machines are this season the Best ever built by our Mr. Henry Martin, whose thirty years' experience has rendered him familiar with the wants of the Trade.

For Strength, Durability, Qantity of Output and Quality of Work, they have no equal.

Brickmakers make no mistake when they buy the Henry Martin Machine.

—MANUFACTURED BY—

The Henry Martin Brick Machine Mfg. Co.,

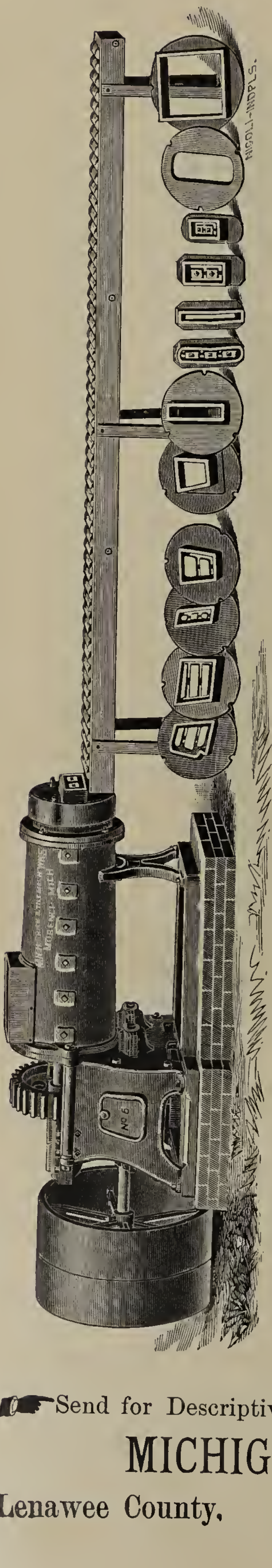
Send for a Catalogue.

LANCASTER, PA., U. S. A

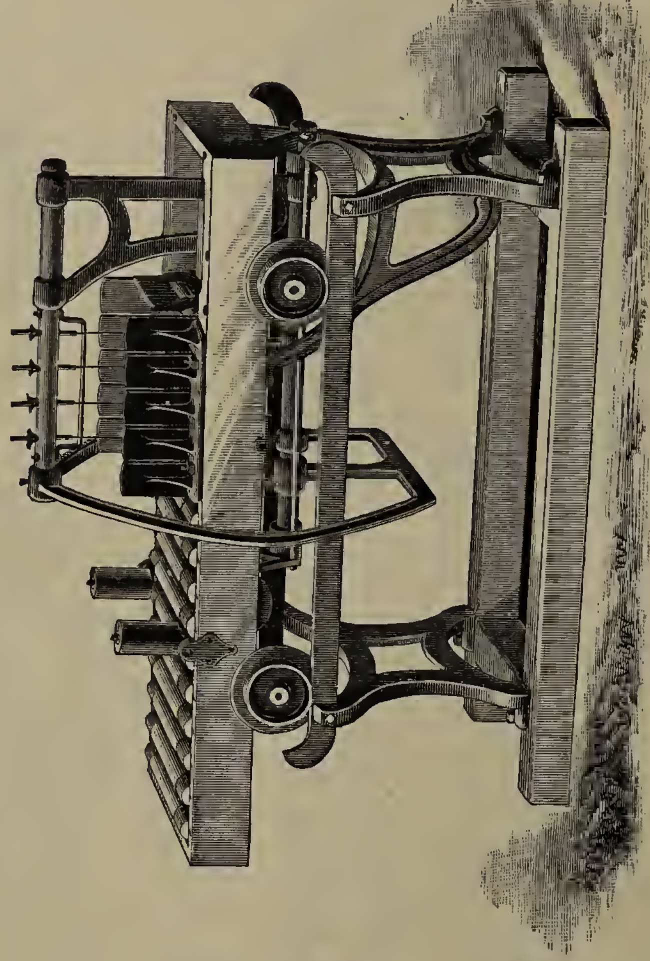
Michigan Brick & Tile Machine Works,

—MANUFACTURERS OF—

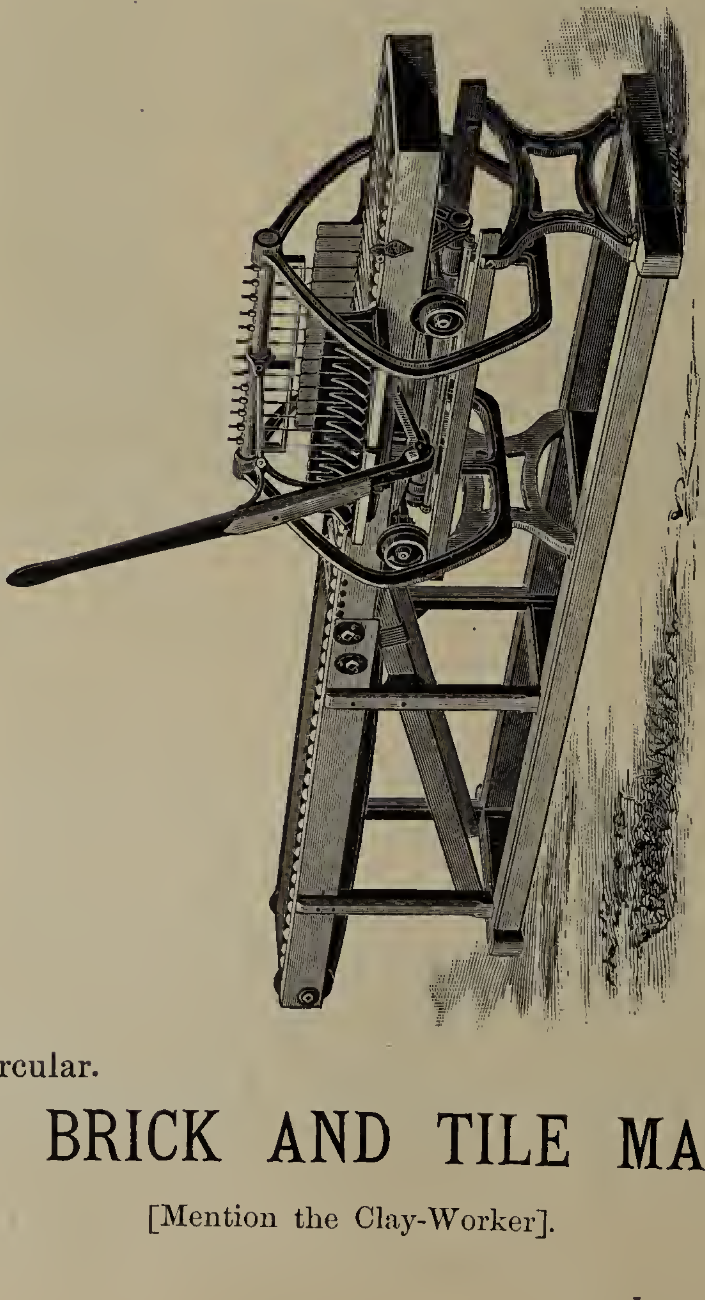
BRICK AND TILE MACHINERY.


NICOLL-MNPLS.

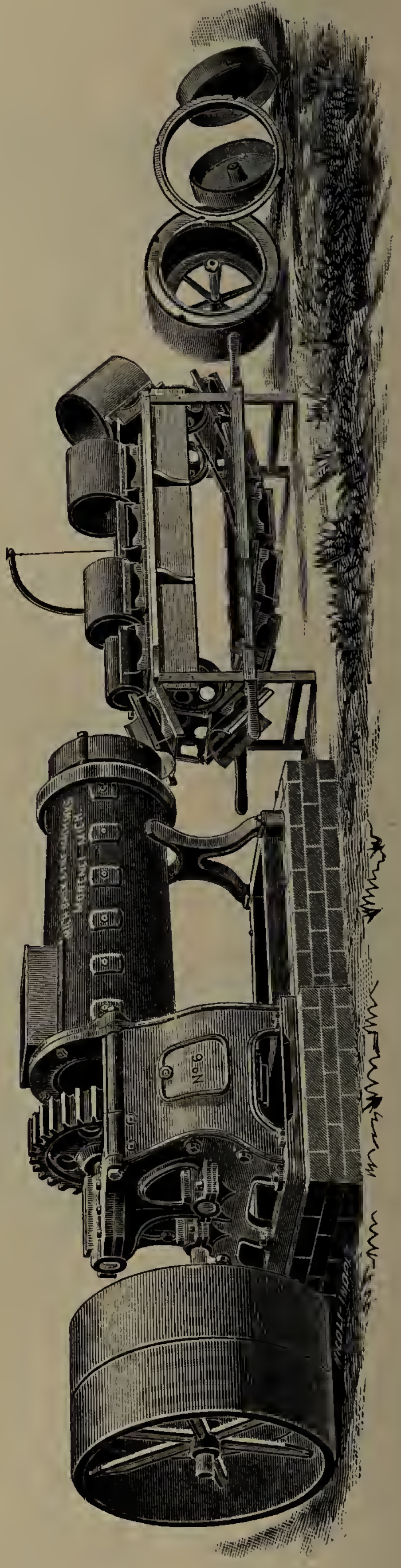
No. 6 Terra Cotta Lumber Machine.



No. 1 Curved Side-Cut.



Special No. 6 Curved Side Cut.



No. 6. Special Brick and Tile Machine.

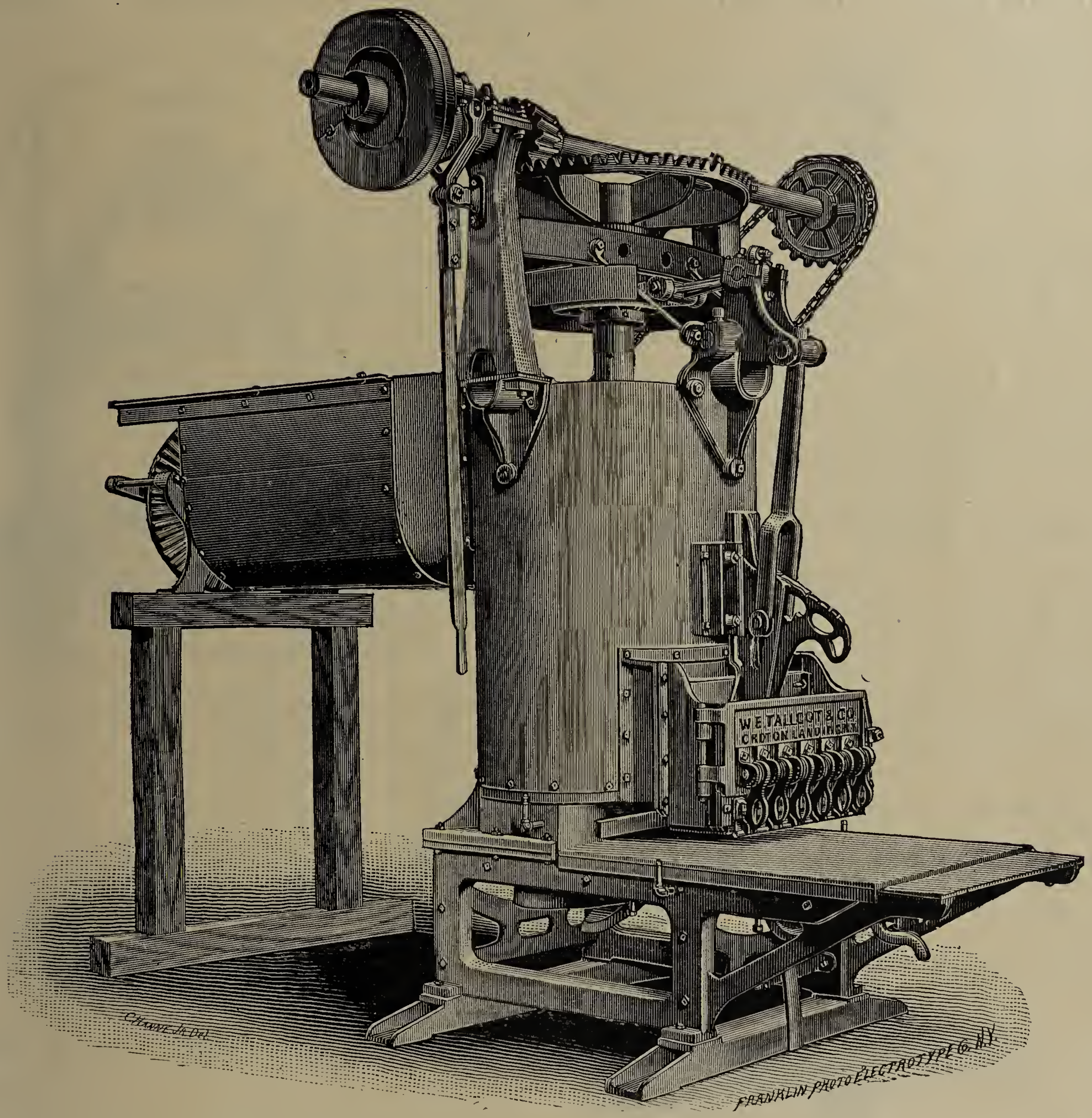
☛ Send for Descriptive Circular.

MICHIGAN BRICK AND TILE MACHINE WORKS,

Lenawee County, [Mention the Clay-Worker]. MORENCI, MICH., U. S. A

W. E. TALLCOT & CO'S.

I. X. L. Brick Machine and Improved Pug Mill.


W. E. TALLCOT & CO.
CROTON LANDING N.Y.
C. HANNE Jr. Del.
FRANKLIN PHOTO ELECTROTYPE Co. N.Y.

This is a simple and powerful machine, making a superior brick and possessing advantages over all others. It is the result of years of experience in using and manufacturing brick machines. Among its advantages are *Great Strength, Simplicity and Durability* few parts, well protected from sand, yet easy of access for adjustment, renewal and repair. No wood is used in its construction; it is made all of iron and steel. Perfect automatic action to prevent breakage by stones or other obstructions. Great tempering capacity and ability to mould very stiff clay. It is easily understood, easily operated, easily kept in order. Quality of brick made, unsurpassed.

The I. X. L. is eipecially designed and built for heavy work. Weight of Machine and Pug Mill 10,000 pounds. Weight of Machine without Pug Mill, 7500 pounds. Send for circular and prices.

It will pay you to use the I. X. L.

W. E. TALLCOT & CO.,

Croton Landing, New York

BRICK - MAKERS' - SUPPLIES.

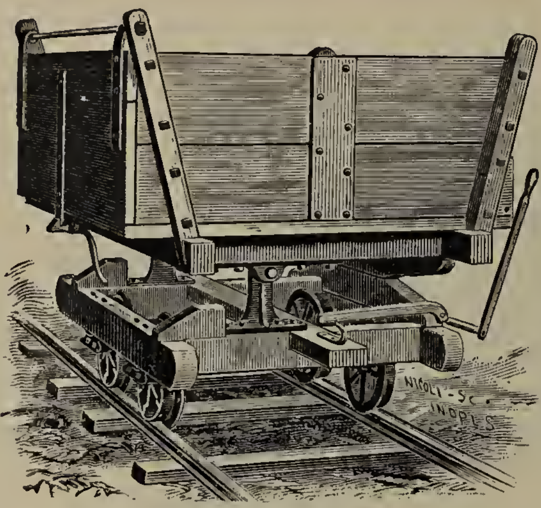
RAYMOND'S
AUTOMATIC - DUMPING - CARS.

- WITH -

PORTABLE TRACK

- - AND - -

WINDING DRUM.



For Brick Yarbs, Gravel Pits, Plantations, Mines, etc. No labor is required either to dump the load or return the empty bed to position. Write for Illustrated Catalogue giving full description.

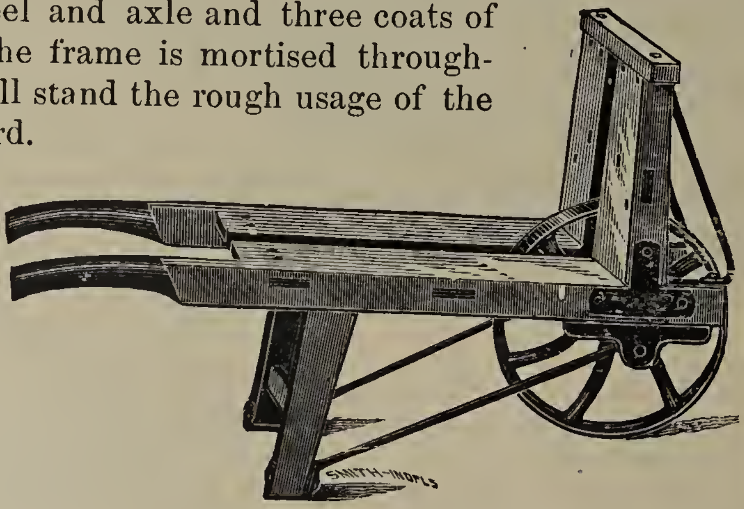
BRICK - MACHINE - MOULDS.

We manufacture a great variety of moulds and are able to fill orders with dispatch. Our moulds are made of the best of cherry wood, iron bound.

Send for Circular.

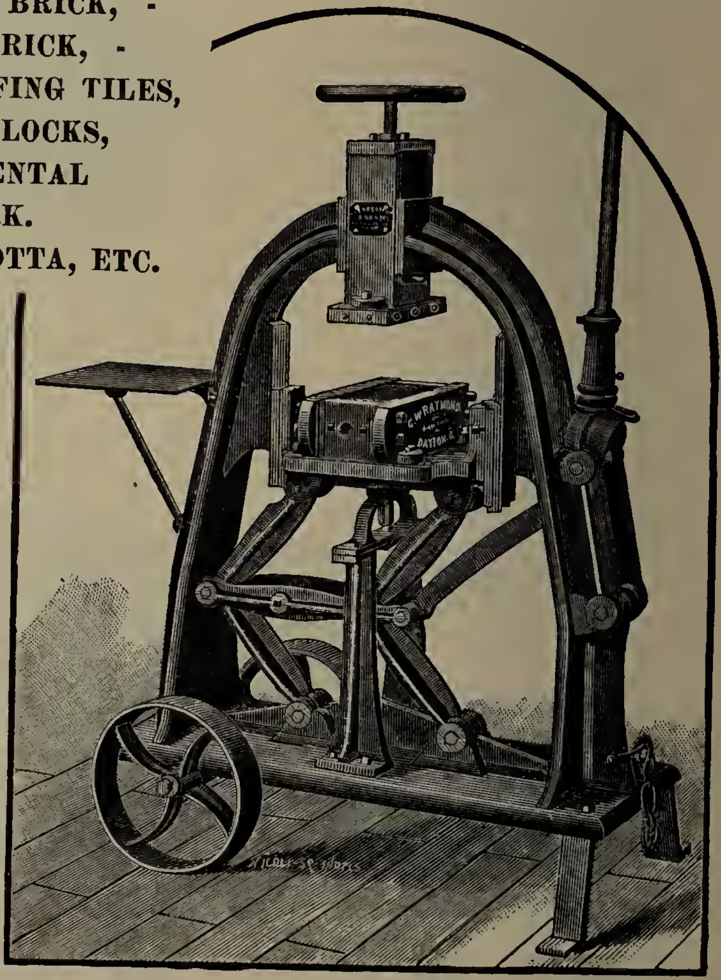
"IDEAL" BRICK - BARROW.

Our Barrows are made from the best of seasoned white-oak, braced in front and cross braces underneath; iron wheel and axle and three coats of paint; the frame is mortised throughout. Will stand the rough usage of the brick yard.



RAYMOND'S
PERFECTION - BRICK - PRESS.

FOR RED BRICK, -
FIRE BRICK, -
ROOFING TILES,
PAVING BLOCKS,
ORNAMENTAL
WORK.
TERRA COTTA, ETC.



A short but powerful movement of one lever only, is required in pressing the brick. An easy working, quick acting, and powerful machine.

OUR - LATEST.

Our No. 4 Power Press, with automatic feed and delivery is the most complete and rapid mechanism for handling and pressing brick ever made.

Its Capacity,

Ten Thousand Perfect Pressed Brick per day.

but limited only by the ability of the operator to feed it.

The entire product of a plant can be repressed upon this rapid working and simple machine at a cost not exceeding 30 cents per thousand.

We invite investigation of its merits.

C. W. RAYMOND & CO.,

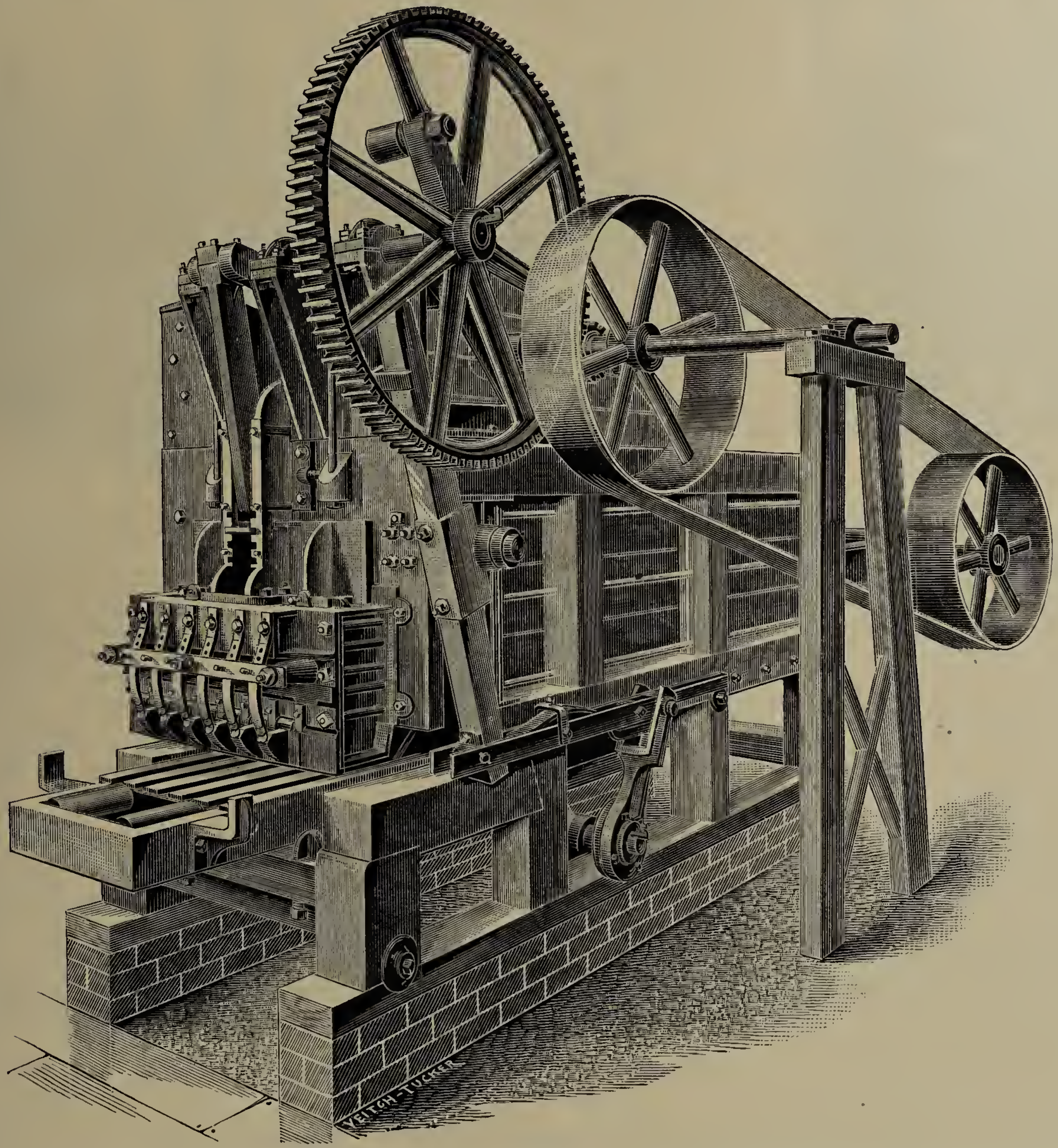
[Mention the Clay-Worker.]

DAYTON, OHIO.

THE "NEW HAVEN"

HORIZONTAL STEAM POWER BRICK MACHINE.

WEIGHS 12,000 POUNDS.



SIMPLE, STRONG, DURABLE.

No Pug Mill Required.

HEAVIEST, MOST POWERFUL, and **BEST MACHINE** on the market for making sand moulded brick being carefully designed to secure the **Greatest Possible Production of First-Class Brick with the Least Outlay and Loss of Time to Repair Breakages.**

We have found Brickmakers (now using this machine) who think it wiser to buy a substantial Machine than waste time, exhaust patience and lose money with the many cheaply constructed machines with which the country is flooded and we are positive there are many others who think the same way. If you are one of them write us and we will tell you all about it.

We believe our years of experience with Brick Machine repairs and the advice of a practical Brickmaker has enabled us to produce a Machine Superior to all.

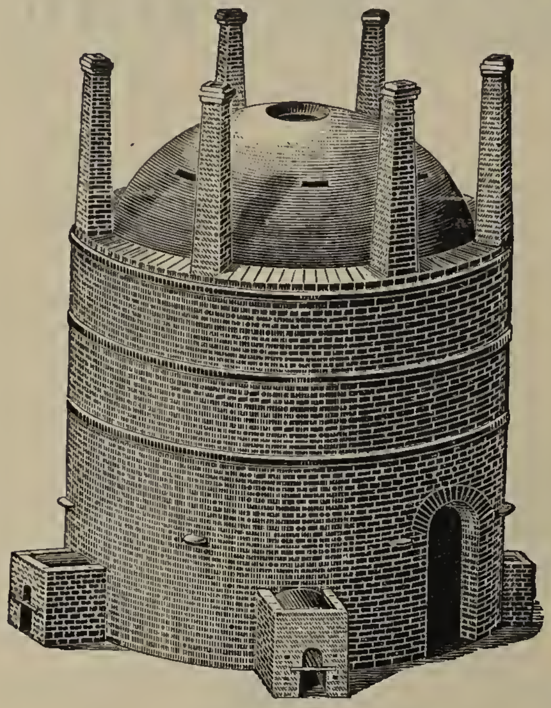
The McLagon Foundry Co.,

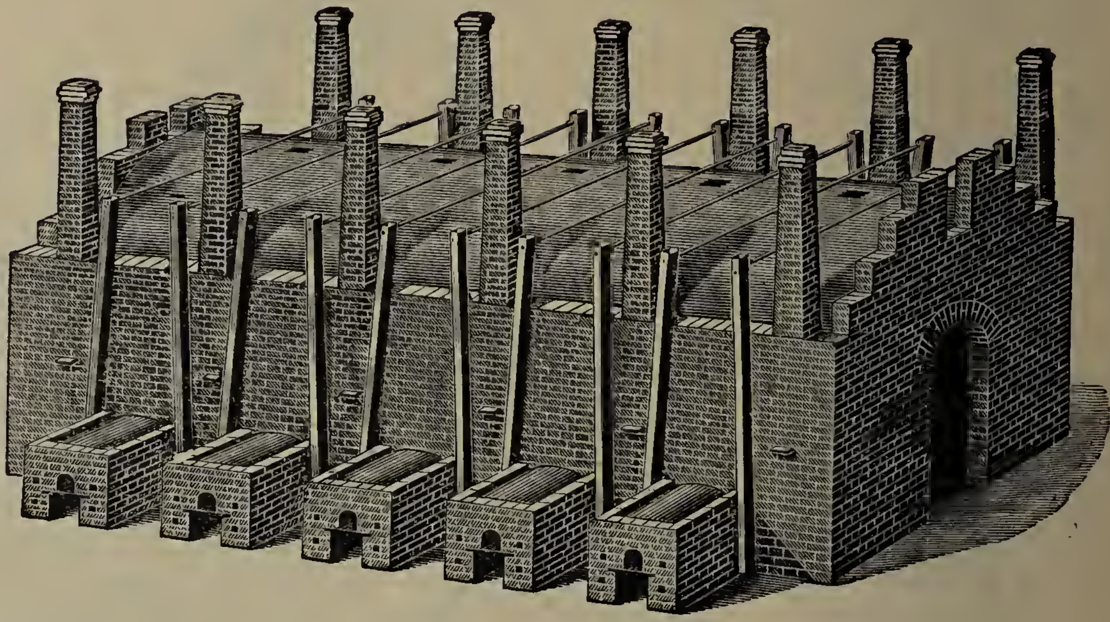
NEW HAVEN, CONN.

[Mention the Clay-Worker].

THE EUDALY KILN.

BURNS ANY KIND OF CLAY OR WARE.





THE DOWN-DRAFT KILN.

UNIFORMITY IN BURNING is without a doubt the most essential feature to clay workers. Especially is this the case with fine clays where it is desired to have the wares of uniform color, size and hardness.

In the construction of these kilns particular attention has been paid to this point, by having first carefully examined the subject of drafts and the strength and nature of the different kinds of fuel. The size of the kiln, the size and number of furnaces, flues and chimneys must always sustain the proper relation to each other for a perfect draft. Too much draft is as dangerous as too little. One of the greatest mistakes of kiln inventors and builders is that they utterly disregard the important subject of drafts.

ABILITY TO DIRECT THE HEAT TO ANY PART OF THE KILN is equally as important as a proper draft. Unless the burner has control of the heat in the kiln he has no assurance of a uniform burn. In these kilns if the burner finds the wares too hot in any portion of the kiln he can in a moment shift the heat to any other part where it is not so hot, or what is better, if he has two or more kinds of wares in the kiln, one of which requires more burning than another, he can easily give that portion of the kiln an extra amount of heat. We claim that this is the only kiln in which these results can be attained successfully.

For this reason wares can be burned by this system **more uniformly** than by any other.

Practically there is no difference from top to bottom, yet this is purely a *down draft* kiln. There are no inside dampers or cut-offs. **Everything about the kiln is permanently built.**

ECONOMY OF FUEL AND LABOR is perhaps the second most important feature of any kiln. We hear a great deal said about "economy in fuel and labor," but to understand what is necessary to a fuel and labor saving kiln one should be thoroughly acquainted with all kinds of fuel and the conditions necessary to get the greatest number of heat units out of it, and at the same time **distribute the heat to the burning wares in the most effective manner.**

We claim that our latest improved furnace is the most **complete economizer** of fuel that has ever been invented.

The construction is purely scientific, and is made by first obtaining the chemical requisites necessary to insure perfect combustion and then building a furnace to bring about these results. Different kinds of fuel require a different size and construction of furnace. We use any kind of fuel, soft coal, screenings, oil, gas or wood.

COST OF CONSTRUCTION—These kilns require no large stack, which ordinarily costs as much as the kiln proper. Many persons think they must have a large, tall stack in order to have sufficient draft to get the bottom of the kiln burned.

This is certainly a mistaken notion.

The things that are required, however, are a correct location and size of furnaces, flues and chimneys with reference to each other and the kiln. When these are properly attained the burner need have no fear about draft.

In these kilns great care has been taken to adjust these relations in such a way that the expensive stack is not at all required, and a much better draft obtained.

DURABILITY.—Each part of these kilns is built with special reference to strength and durability.

The furnaces, which are perhaps the most perishable parts of any kiln, are in these kilns made very strong and durable.

Those parts most liable to burn out can be easily removed and replaced without damage to the other parts of the furnace.

Rules are given by which a builder of these kilns can get the strongest crown and best supports to the kiln.

SIZES.—These kilns can be built either **round** or **square**, and of **any** desired **size.** A number of these kilns are now in use that burn from **150** to **250** thousand bricks at a time. The walls are built **twenty-four inches thick.** They should be lined throughout with fire-brick where the clay is very hard to burn. Good kilns can be made, however, without using fire-brick for any part except the **furnaces** and **bags.** In asking for cost of construction **state size of kiln in feet wanted,** whether the kiln walls, crown or bottom are any or all to be lined with fire-brick.

DRAWINGS and specifications for building kilns will be furnished any who purchase *kiln or yard rights.* We usually can urnish a man to superintend the building if desired.

For further information address

W. A. EUDALY,

64 Johnston's Building, - - - - **CINCINNATI, OHIO.**

MORRISON'S
IMPROVED KILN

FOR -:- BURNING -:- CLAY -:- WARES

Especially adapted to Burning Common, Repressed and Ornamental Brick.

PATENTED IN UNITED STATES AND CANADA.

SUCCESSFUL! DURABLE!

Daily product of our Kilns in the United States, One-Half Million Bricks. Our claims fully substantiated BY OUR PATRONS. We claim ninety to ninety-five per cent. hard brick. Arch bricks all Fronts and Pavers and none damaged—of uniform color. Pressed brick burned without fire-marks—coal screenings preferred for fuel. One fireman for two hundred thousand bricks. The

Only Kiln That Regulates the Temperature of Heat

And directs its course by a system of air drafts, giving complete control of the degree of heat, as well as its manipulation. This system we have covered by letters patent. Any persons using these air drafts are liable to prosecution for infringement.

Read the following testimonial from a recent patron, and another new one from an old patron:

Knoxville, Tenn., October 31st, 1888.

R. B. Morrison, & Co., Rome, Ga.:

GENTLEMEN—I have used your *Improved Kilns* during the past twelve months and cheerfully report the result. We burn our bricks in your Kiln at a cost of sixty-five cents per thousand for fuel and labor; a saving to us, over our old method, of eighty cents per thousand on the two items. My saving in waste brick in the kiln and at the building is fully *ten per cent.*, or sixty cents per thousand in other words Every time I burn your kiln of 300,000 bricks it is a saving to me of *more than four hundred dollars* over the old process. I find your kiln durable and simple to operate. We use coal screenings for fuel. Have no waste in arches, and burn ninety per cent. hard brick. I have no hesitation in pronouncing your kiln a success in every respect, as you make no claims it does not fulfill. Yours Truly,

REPS. JONES.

Atlanta, Ga., July 20th, 1888.

R. B. Morrison & Co., Rome, Ga.:

GENTLEMEN—We have used your Improved Kilns for three years and during that time have burned upward of a hundred millions in them and wish to emphasize our former statement in regard to your kilns. They are reliable, durable, and the best kilns for our purpose, we have been able to find after investigating many of the various kilns in use, and say to our friends of the trade: If you want kilns that will burn your brick nearly all hard, and do it every time, burn them economically and without loss, and with little cost for repairs, secure the Morrison Kiln. CHATTAHOOCHEE BRICK CO., per GEO. W. PARROT, Vice-Pres.

Royersford, Pa., (near Philadelphia) August 20, 1889.

Mr. E. Petts: DEAR SIR—In reply to your letter will state that our Morrison Kiln turned out O. K. It was the best kiln of brick we ever saw—*no waste and nearly all hard.* A. T. KEELEY.

—WE SELL OUR KILN STRICTLY ON MERIT—

☛For descriptive circulars, additional testimonials, and all information desired, address

R. B. MORRISON & CO.,

Box 335, - - - - ROME, GEORGIA.

CHAMBERS BROTHERS Co.,

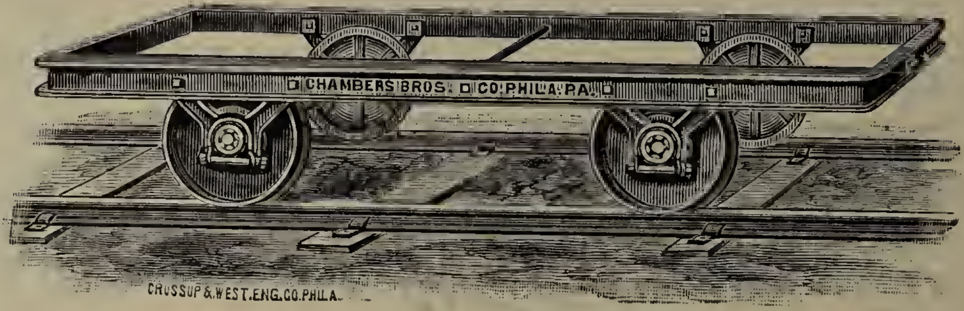
FIFTY-SECOND ST., BELOW LANCASTER AVE,

PHILADELPHIA, PA.

Improved Tunnel Dryers For Common Brick

And the Most Durable and Complete System for Transporting Green Brick.

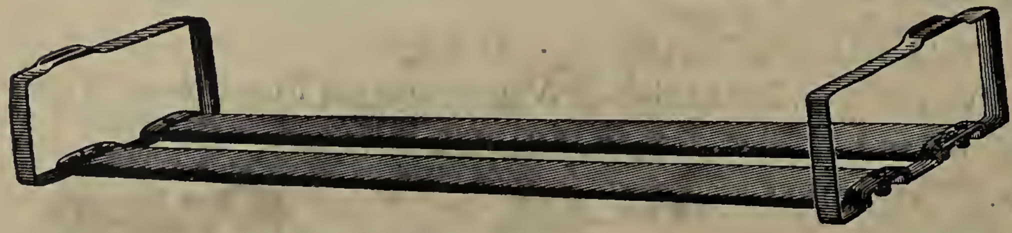
The Strongest Car Made.


CHAMBERS BROS. CO. PHILA. PA.
CHASSUP & WEST.ENG.CO.PHILA.

The Strongest Car Made.

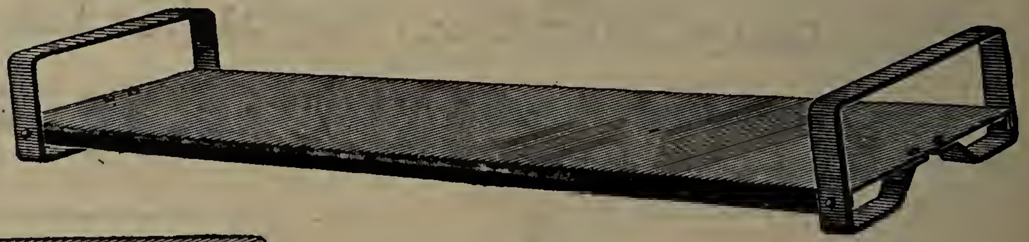
CHAMBERS' WROUGHT-BODY DRYER CAR.

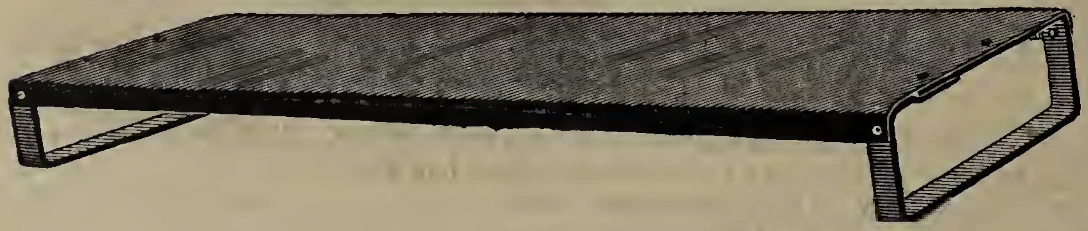
A lower priced Car with cast iron bodies made to order.



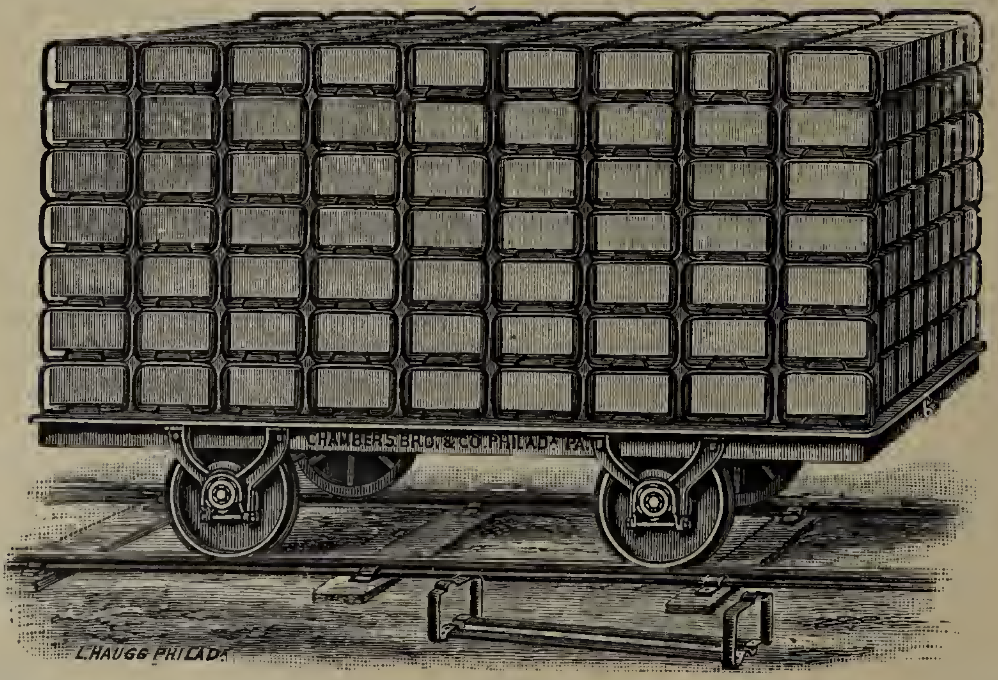
Wrought Iron Interlocking Pallet for Stiff Tempered Brick only.

Steel Pallet for brick placed on flat side or on edge.





Steel Pallet for soft moulded brick, or those placed on flat side only.


CHAMBERS BRO. & CO. PHILAD. PA.
L.HAUGG PHILADA

CHAMBERS BROTHERS COMPANY,

PHILADELPHIA, - - PA.

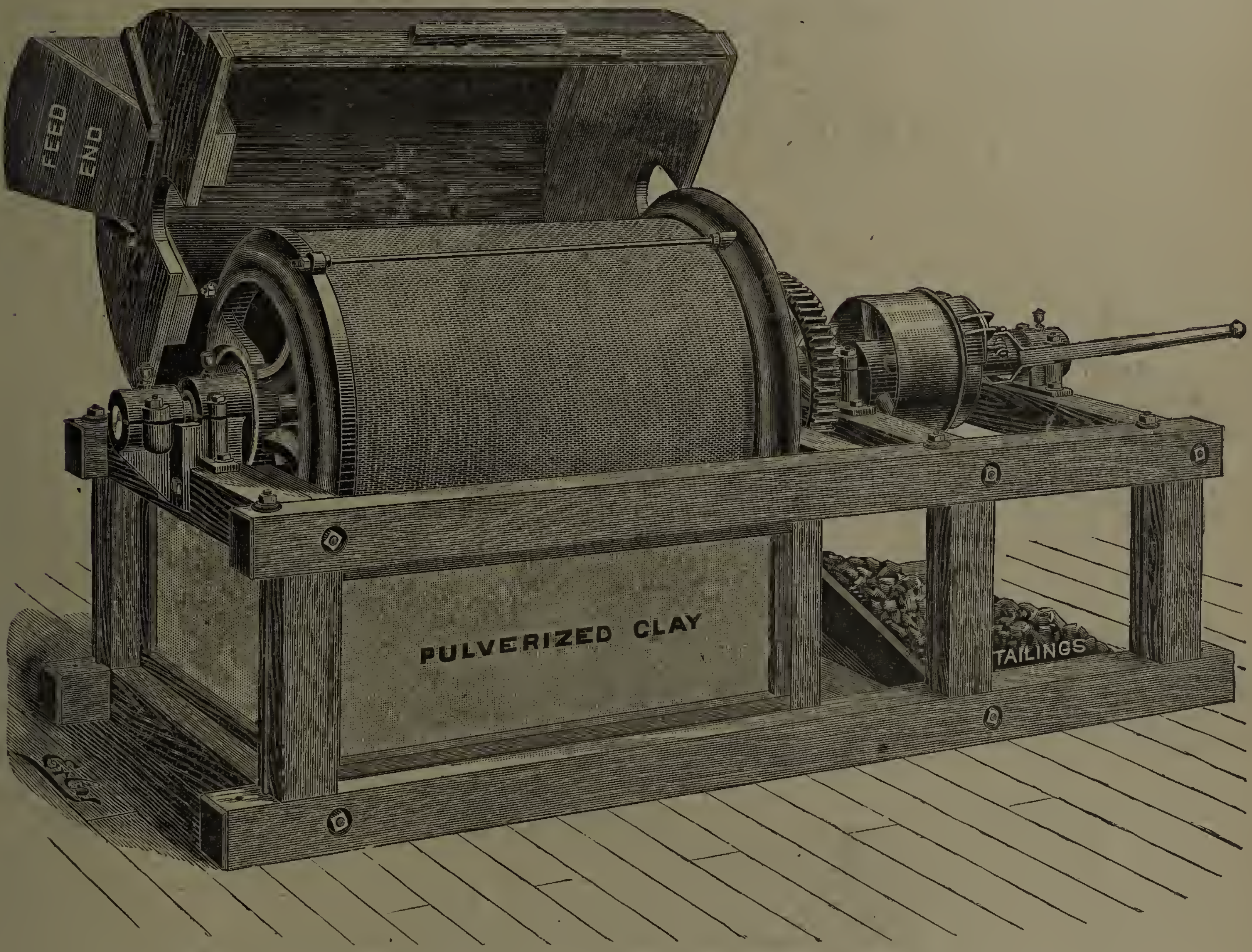
☞See ad. on front cover page.

[Mention the Clay-Worker.]

THE BOYD IMPROVED
CLAY PULVERIZER AND STONE SEPARATOR.

—ACKNOWLEDGED THE BEST.—

All Brick, Tile and Pottery Factories using this Machine say they would not be without it.



PATENTED OCT. 19 AND NOV. 3, 1885.

I OFFER to those engaged in Clay-working, a machine that has no equal for removing Stones, Roots, Pebbles or other foreign substances, and reducing Clay to Granules for Dry or Semi-Dry Press Brick, Terra-Cotta, Tile or other articles made from Clay which require a **strictly pure material.** It is especially valuable to makers of Fine Press Brick, Tile or Terra-Cotta, as the limestones and pebbles are removed entire—not crushed and left in the clay. This machine is not a crusher and will not pulverize wet clay or mud. The clay to be pulverized in this machine must be in a dry or semi-dry state.

Its capacity is clay enough for **15** to **25** thousand bricks per day of 10 hours and requires only from **4** to **6** horse-power to drive. I also make a smaller size, capacity enough for **10** to **12** thousand bricks per day.

ROBERT B. SMITH,
Licensed Manufacturer.

OFFICE, NOS. 116 and 118 DEARBORN STREET.
CHICAGO, ILL.

AGENT FOR ALL KINDS OF BRICK MACHINERY.

IMPROVED
CHAMPION + BRICK + MOLD + SANDING + MACHINE.

Saves more sand; requires one-half the power to run it; has its gearing compounded, arranged compactly and covered to prevent wear or injury from sand, thus adding seventy-five per cent. to its term of usefulness: runs nearly one-half slower doing the same quantity of work, yet gives the operator more time to properly jar the molds and feed the brick machine. The improved feed prevents the molds from lumping up, thereby producing a cleaner and smoother brick. The entire cylinder is constructed of metal, whereby warping, swelling or shrinking is prevented. Send for testimonials.

CAUTION:

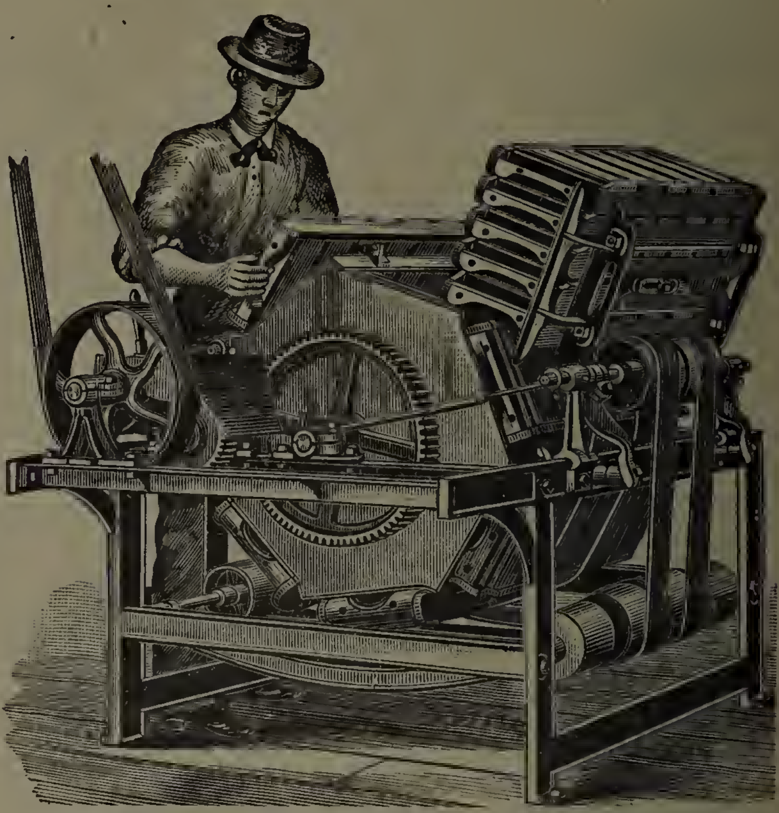
We respectfully inform all parties interested that our machine is covered by several patents having broad claims, including among other features the use of a cylinder and a belt moving with the cylinder, and serving to keep the molds in place while being sanded, and that we shall prosecute all parties using infringing machines and we advisedly specify as such one known as the Potts' Sander, manufactured at Indianapolis, Indiana.

To prove the good faith which prompted us publish the above caution, it is stated that we have brought suit in the United States Circuit Court for the Eastern District of Pennsylvania, against J. C. Keener & Sons, of Middletown, Pa., who bought and used a Potts Sander, as infringing of our several patents on the Champion Sander. We shall insist upon our rights under our patent until infringers shall cease manufacturing, using or selling infringing machines.

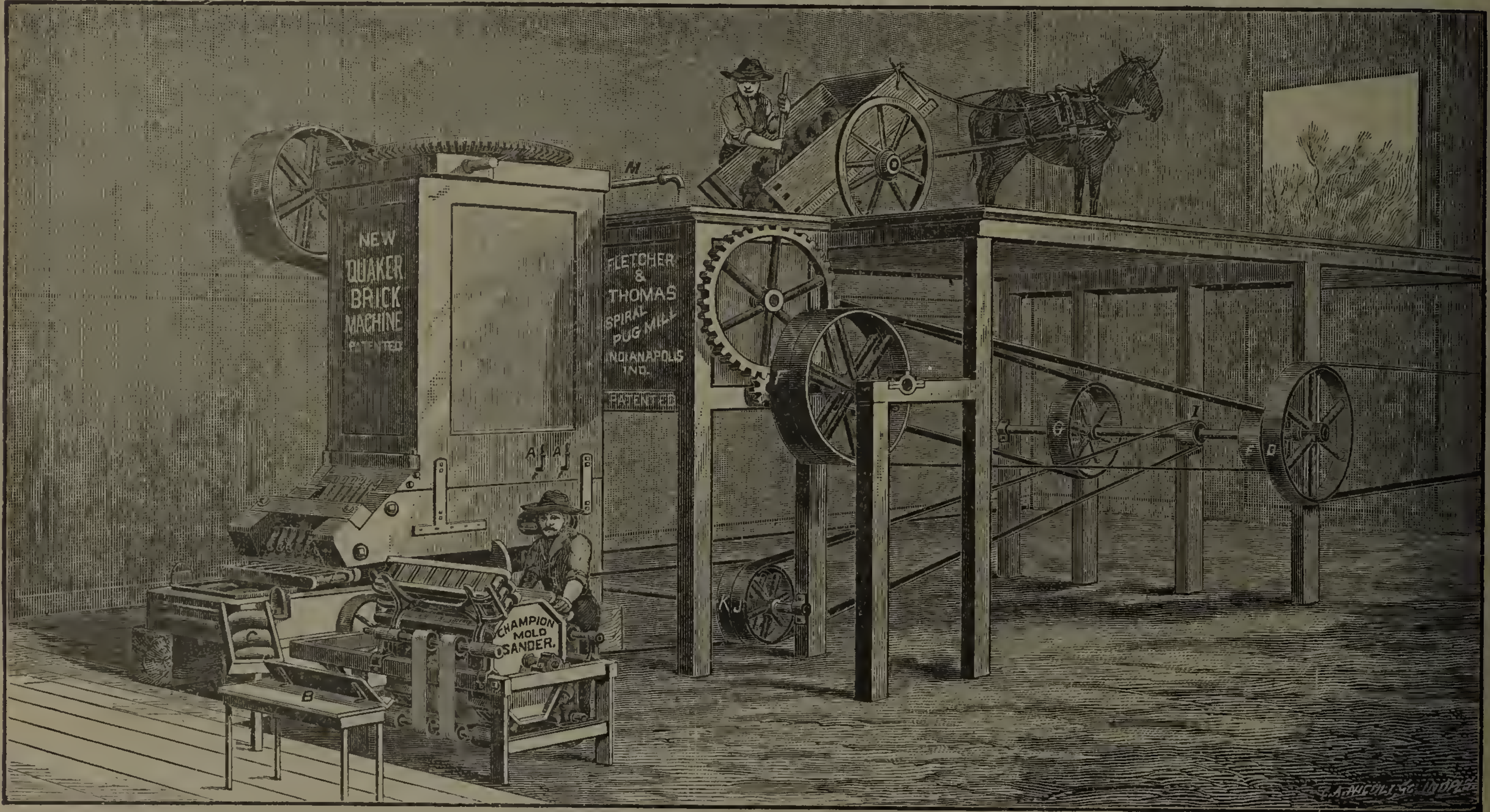
A. H. NEWTON,
Sole Proprietor,

Eastern Factory at Cohoes, N.Y.
[See article page 242 in Clay-Worker, April, 1889.]

Western Factory, Cincinnati, Ohio.
[Jonathan Creager's Sons, Proprietors.



FLETCHER & THOMAS, INDIANAPOLIS, IND.


NEW QUAKER BRICK MACHINE PATENTED
FLETCHER & THOMAS SPIRAL PUG MILL INDIANAPOLIS IND.
PATENTED
CHAMPION MOLD SANDER.

Improved Brick Machinery and Brickmaker's Supplies.

The best is always the cheapest, especially in brick machinery which requires the greatest strength and durability. We claim that the NEW IMPROVED QUAKER is one of the very best Brick Machines in use and that our SPIRAL PUG MILL is unequalled as a tempering machine, and that the prices for our machinery is far less than that of any other first-class brick machinery in this country. We furnish everything in the brickmaking line, including Engines, Boilers, Shafting, Pulleys, Belting, etc., and contract to set up complete outfits ready for work. Send for illustrated catalogue. Correspondence solicited.

FLETCHER & THOMAS, - - Indianapolis, Ind.

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